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WATER QUALITY OF INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

MONITORING REPORT NO. 3

WATER YEAR 1989

(OCTOBER 1988-SEPTEMBER 1989)

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WATER QUALITY OF INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN MONITORING REPORT #3 WATER YEAR 1989 (OCTOBER 1988 – SEPTEMBER 1989)

SUSQUEHANNA RIVER BASIN COMMISSION

RESOURCE QUALITY MANAGEMENT & PROTECTION DIVISION

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The Susquehanna River Basin Commission was created as an independent agency by a Federal-Interstate Compact* among the States of Maryland, New York, Commonwealth of Pennsylvania and the Federal Government. In creating the Commission, the Congress and State Legislatures formally recognized the water resources of the Susquehanna River basin as a regional asset vested with local, State and National interests for which all the parties share responsibility. As the single Federal-Interstate water resources agency with basinwide authority, the Commission's goal is to effect coordinated planning, conservation, management, utilization, development and control of basin water resources among the government and private sectors.

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* Statutory Citations: Federal - Pub. L. 91-575, 84 Stat. 1509 (December, 1970); Maryland - Natural Resources §8-301 (Michie 1974); New York - ECL §21-1301 (McKinney 1973); and Pennsylvania - 32 P.S. 820.1 (Supp. 1976).

WATER QUALITY OF INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

MONITORING REPORT #3

WATER YEAR 1989

(October 1988 - September 1989)

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and

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streams in the Susquehanna

ABSTRACT

Water samples were collected from twelve stations on interstate streams in November 1988, and February, May and August 1989. Water samples were collected from 23 stations on other interstate streams. Benthic macroinvertebrates were sampled from each station in July and August 1989. The data collected is used 1) to assess compliance with water quality standards; 2) to assess impacts on water quality; 3) to characterize ambient and seasonal stream quality; and 4) for future trend assessment.

Scott Creek is the only interstate stream having poor water quality. Untreated sewage discharges from Cardiff, Maryland impairs water quality and biological conditions. The Cowanesque River exhibits biological impacts due to Cowanesque Lake, but impacts on water quality were minor. The Chemung River showed slight to moderate impairment of macroinvertebrates and water quality due to waste water discharges from Elmira. Octoraro Creek and Tioga River showed moderate macroinvertebrate impairment coincident with elevated concentrations of some chemical parameters. Elevated chemical concentrations were observed in the Suquehanna River at Sayre and Cayuta Creek; however, no macroinvertebrate impairment was observed. Falling Branch Deer Creek, Big Branch Deer Creek, Troups Creek and Trowbridge Creek showed varying degrees of macroinvertebrate impairment, but no specific causes were indicated by water quality data. Most interstate streams have good water quality. Only 39 out of 1,460 observations exceeded water quality standards. Aluminum most commonly exceeded standards.

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INTRODUCTION

The Susquehanna River Basin Commission (SRBC) reviews projects and policies for potential impacts on interstate water resources in the Susquehanna River Basin. Current water quality data are needed to conduct these reviews. However, monitoring programs conducted by Maryland, Pennsylvania and New York do not cover all of the interstate streams and do not produce comparable data. Thus SRBC established a monitoring program to collect data needed to assess potential impacts on the water quality of interstate streams. This ongoing program is partially funded through an Environmental Protection Agency grant.

The monitoring program includes periodic collection of water samples from interstate streams. Chemical data are used to assess compliance with state water quality standards; to provide for the characterization of stream quality and seasonal variations; and to build a database for the future assessment of water quality trends. Biological conditions are monitored by assessing benthic macroinvertebrate populations. Benthic macroinvertebrates provide a measure of a stream's biological health and serve as indicators of water quality.

Monitoring began in April 1986. Results are reported on annual Water Years (WY) that run from October to September (McMorran, 1988; McMorran and Bollinger, 1989) This report covers WY 1989 from October 1988 to September 1989.

BASIN GEOGRAPHY

The Susquehanna River Basin is the largest river basin on the Atlantic Coast of the United States; draining 27,580 square miles (Figure 1). The Susquehanna River originates at the outlet of Otsego Lake at Cooperstown, New York and flows 450 miles through New York, Pennsylvania and Maryland to the Chesapeake Bay at Havre de Grace, Maryland. Eighty-three streams make a total of 91 stream crossings of state lines in the Basin (Table 1). More than half of these streams (43) flow from New York into Pennsylvania. Twenty-four cross from Pennsylvania into New York, 15 from Pennsylvania into Maryland, and nine from Maryland into Pennsylvania. Many streams are small; 32 are unnamed.

SCOPE

Stream stations sampled during WY 1989 are listed in Table 2 and shown on Figures 2 through 5. Other named interstate streams are also shown in these figures. Interstate streams are divided into three groups. Group 1 stations were on streams with impaired water quality or where a high potential for degradation was judged to exist. Group 2 stations were on streams judged to have moderate potential for impacts. Group 3 streams were judged to have a low potential for impacts.

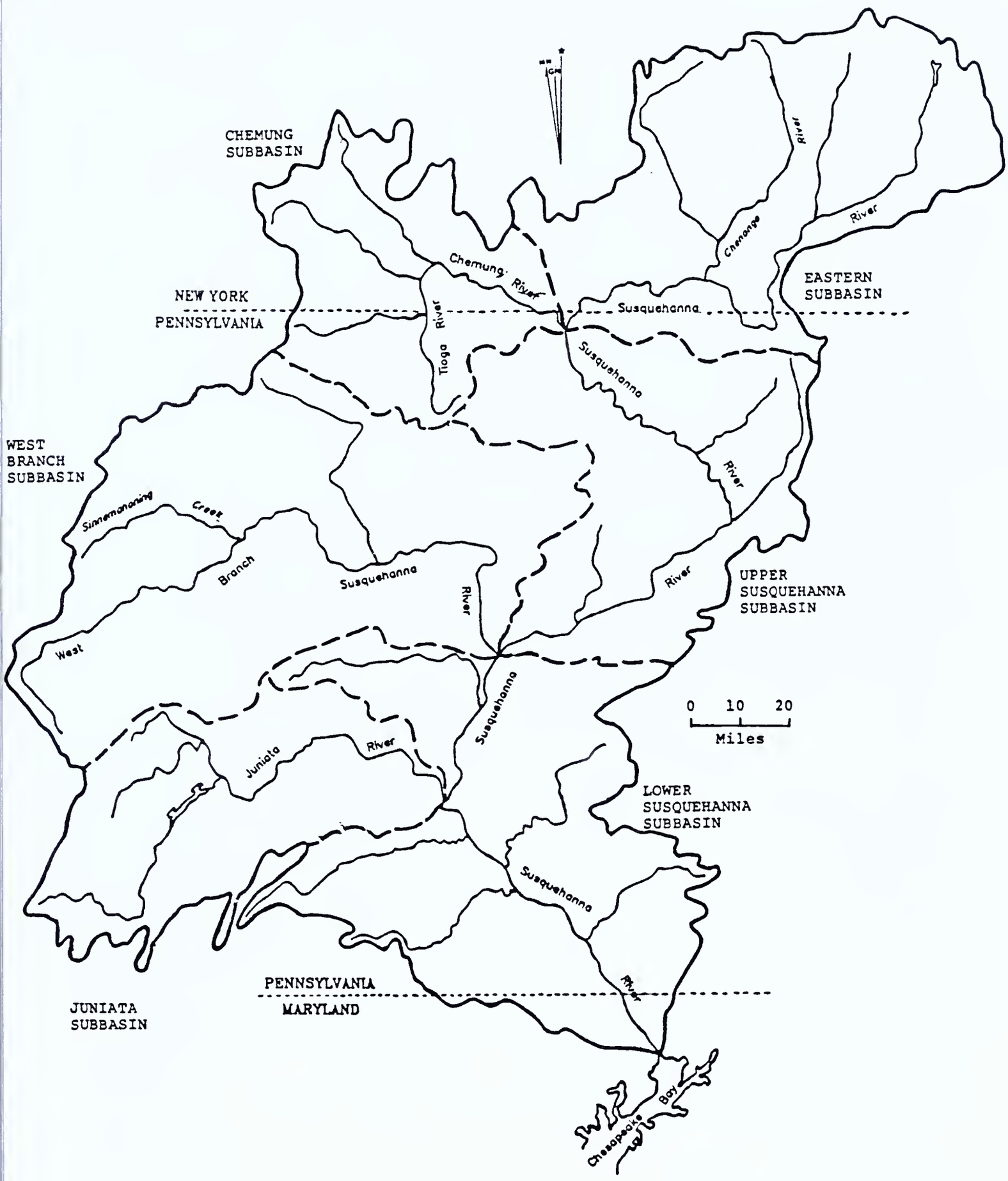


FIGURE 1 - Susquehanna River Basin

TABLE 1

INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

Between Pennsylvania and Maryland	Monitoring Group	Direction
Big Branch Deer Creek	2	PA->MD
Conowingo Creek	1	PA->MD
Deer Creek	1	PA->MD
Ebaughs Creek	1	PA->MD
Falling Branch Deer Creek	2	PA->MD
Island Branch	3	PA->MD
Long Arm Creek	2	MD->PA
Octoraro Creek	1	PA->MD
Scott Creek	1	MD->PA
South Branch Conewago Creek	2	MD->PA
Susquehanna River	1	PA->MD
6 Unnamed tributaries	3	MD->PA
7 Unnamed tributaries	3	PA->MD

Between Pennsylvania and New York	Monitoring Group	Direction
Apalachin Creek	2	PA->NY
Babcock Run	3	NY->PA
Bentley Creek	2	PA->NY
Bill Hess Creek	2	NY->PA
Bird Creek	2	PA->NY
Biscuit Hollow	3	NY->PA
Briggs Hollow Run	2	NY->PA
Bulkley Brook	2	NY->PA

TABLE 1
(continued)

INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

Between Pennsylvania and New York	Monitoring Group	Direction
Camp Brook	2	NY->PA
Cascade Creek	2	NY->PA
Cayuta Creek	1	NY->PA
Chemung River	1	NY->PA->NY->PA
Choconut Creek	2	PA->NY
Cook Hollow	3	NY->PA
Cowanesque River	2	PA->NY
Deep Hollow Brook	3	NY->PA
Denton Creek	2	NY->PA
Dry Brook	3	NY->PA
Holden Creek	2	NY->PA
Little Snake Creek	2	PA->NY
Little Wappasening Creek	2	PA->NY
North Fork Cowanesque River	2	NY->PA
Parks Creek	2	PA->NY
Prince Hollow Run	3	NY->PA
Red House/Beagle Hollow	3	NY->PA
Russell Run	2	NY->PA
Sackett Creek	2	PA->NY
Seeley Creek	2	PA->NY
South Creek	2	PA->NY
Snake Creek	2	PA->NY
Strait Creek	3	NY->PA
Susquehanna River	1	NY->PA->NY->PA

TABLE 1
(continued)

INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

Between Pennsylvania and New York	Monitoring Group	Direction
Tioga River	1	PA->NY
Troups Creek	2	NY->PA
Trowbridge Creek	2	NY->PA
Wappasening Creek	2	PA->NY
White Branch	2	NY->PA
White Hollow	3	PA->NY
17 Unnamed tributaries	3	NY->PA
2 Unnamed tributaries	3	PA->NY
2 Unnamed tributaries	3	PA->NY->PA
1 Unnamed tributary	3	NY->PA->NY

TABLE 2

STATION LOCATIONS AND RATIONALES FOR GROUP 1

STATION	STREAM/ LOCATION	GROUP	RATIONALE
SUSQ 44.5	Susquehanna River Columbia, Pa.	1	Bracket of hydro-electric dams near the stateline.
SUSQ 4.8	Susquehanna River Port Deposit, Md.	1	Bracket of hydro-electric dams near stateline.
SUSQ 340.0	Susquehanna River Kirkwood, N.Y.	1	Large drainage area (2,232 sq. mi.); historical pollution due to sewage from Lanesboro, Oakland, Susquehanna, Great Bend and Hallstead.
SUSQ 365.0	Susquehanna River Windsor, N.Y.	1	Large drainage area (1,882 sq. mi.); municipal discharges from Cooperstown, Sidney, Bainbridge and Afton.
OCTO 6.6	Octoraro Creek New Bridge, Md.	1	High nutrient loads from agricultural runoff. Water quality impacts from Octoraro Lake. Non-point runoff to Chesapeake Bay.
CNWG 4.4	Conowingo Creek Pleasant Grove, Pa.	1	High nutrient loads and other agricultural runoff. Non-point runoff to Chesapeake Bay
SCTT 3.0	Scott Creek Delta, Pa.	1	Pollution from untreated sewage.
FBDC 4.1	Falling Branch Deer Creek Fawn Grove, Pa.	2	
BBDC 4.1	Big Branch Deer Creek Fawn Grove, Pa.	2	
EBAU 1.5	Ebaughs Creek Stewartstown, Pa.	1	Municipal discharge from Stewartstown. Non-point runoff to Chesapeake Bay.
DEER 44.5	Deer Creek Gorsuch Mills, Md.	1	Past pollution from Stewartstown. Non-point runoff to Chesapeake Bay.

TABLE 2
(continued)

STATION LOCATIONS AND RATIONALES FOR GROUP 1

STATION		STREAM/ LOCATION	GROUP/RATIONALE	
SBCC	20.4	South Branch Conewago Creek Bandanna, Pa.	2	
LNGA	2.5	Long Arm Creek Bandanna, Pa.	2	
CASC	1.6	Cascade Creek Lanesboro, Pa.	2	
TROW	1.6	Trowbridge Creek Great Bend, Pa.	2	
SNAK	2.3	Snake Creek Brookdale, Pa.	2	
LSNK	7.6	Little Snake Creek Brackney, Pa.	2	
CHOC	9.1	Choconut Creek Vestal Center, N.Y.	2	
APAL	6.9	Apalachin Creek Little Meadows, Pa.	2	
WAPP	2.6	Wappasening Creek Nichols, N.Y.	2	
SACK	2.6	Sackett Creek Litchfield, Pa.	2	
PARK	0.7	Parks Creek Litchfield, Pa.	2	
CAYT	1.7	Cayuta Creek Waverly, N.Y.	1	Municipal discharge from Waverly.
CHEM	12.0	Chemung River Chemung, N.Y.	1	Municipal and industrial discharges from Elmira.
BNTY	0.9	Bentley Creek Wellsburg, N.Y.	2	
SOUT	2.8	South Creek Fassett, Pa.	2	
SEEL	10.3	Seeley Creek Seeley Creek, N.Y.	2	

TABLE 2
(continued)

STATION LOCATIONS AND RATIONALES FOR GROUP 1

STATION		STREAM/ LOCATION	GROUP/RATIONALE	
TIOG	10.8	Tioga River Lindley, N.Y.	1	Pollution from acid mine discharges and impacts from flood control reservoirs.
COWN	2.2	Cowanesque River Lawrenceville, Pa.	2	
HESS	0.1	Bill Hess Creek Nelson, Pa.	2	
CPBK	2.0	Camp Brook Osceola, Pa.	2	
HLDN	3.5	Holden Creek Woodhull, N.Y.	2	
TRUP	4.5	Troups Creek Austinburg, Pa.	2	
NFCR	7.6	North Fork Cowanesque River North Fork, Pa.	2	
WTBR	1.5	White Branch North Fork, Pa.	2	

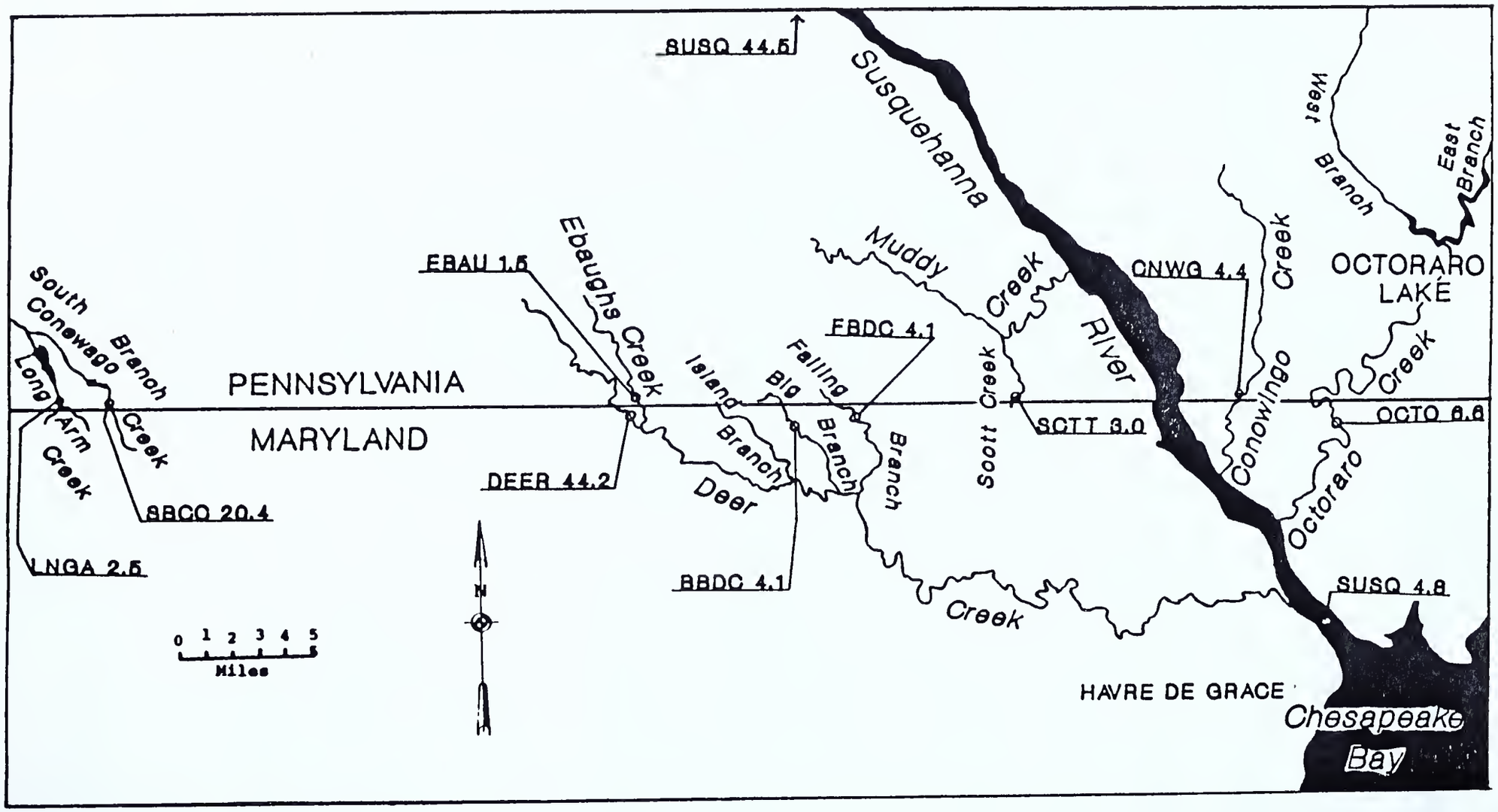


FIGURE 2 - Interstate Streams Along the Maryland/Pennsylvania Border

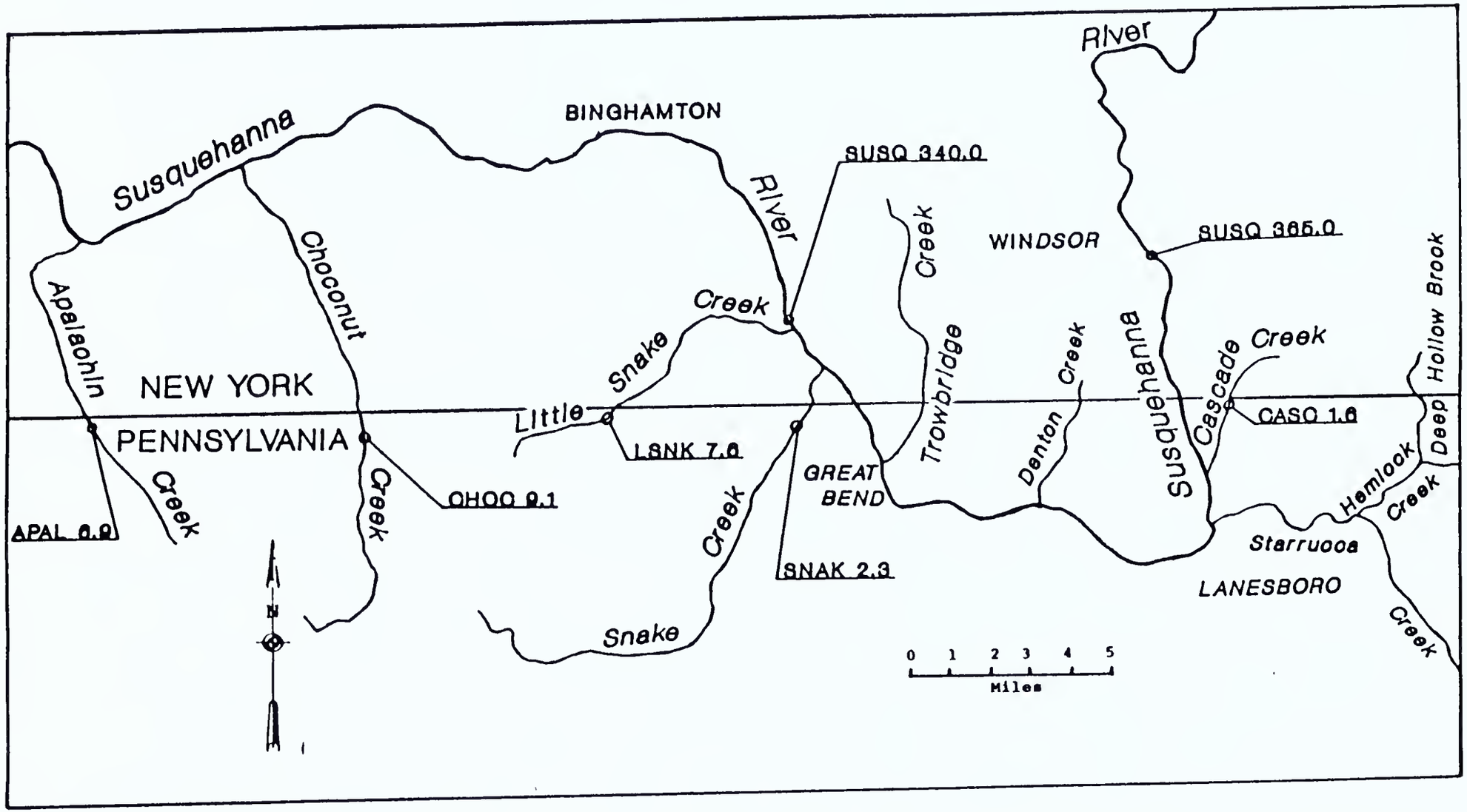


FIGURE 3 - Interstate Streams Along the New York/Pennsylvania Border Between Deep Hollow Brook and Apalachin Creek

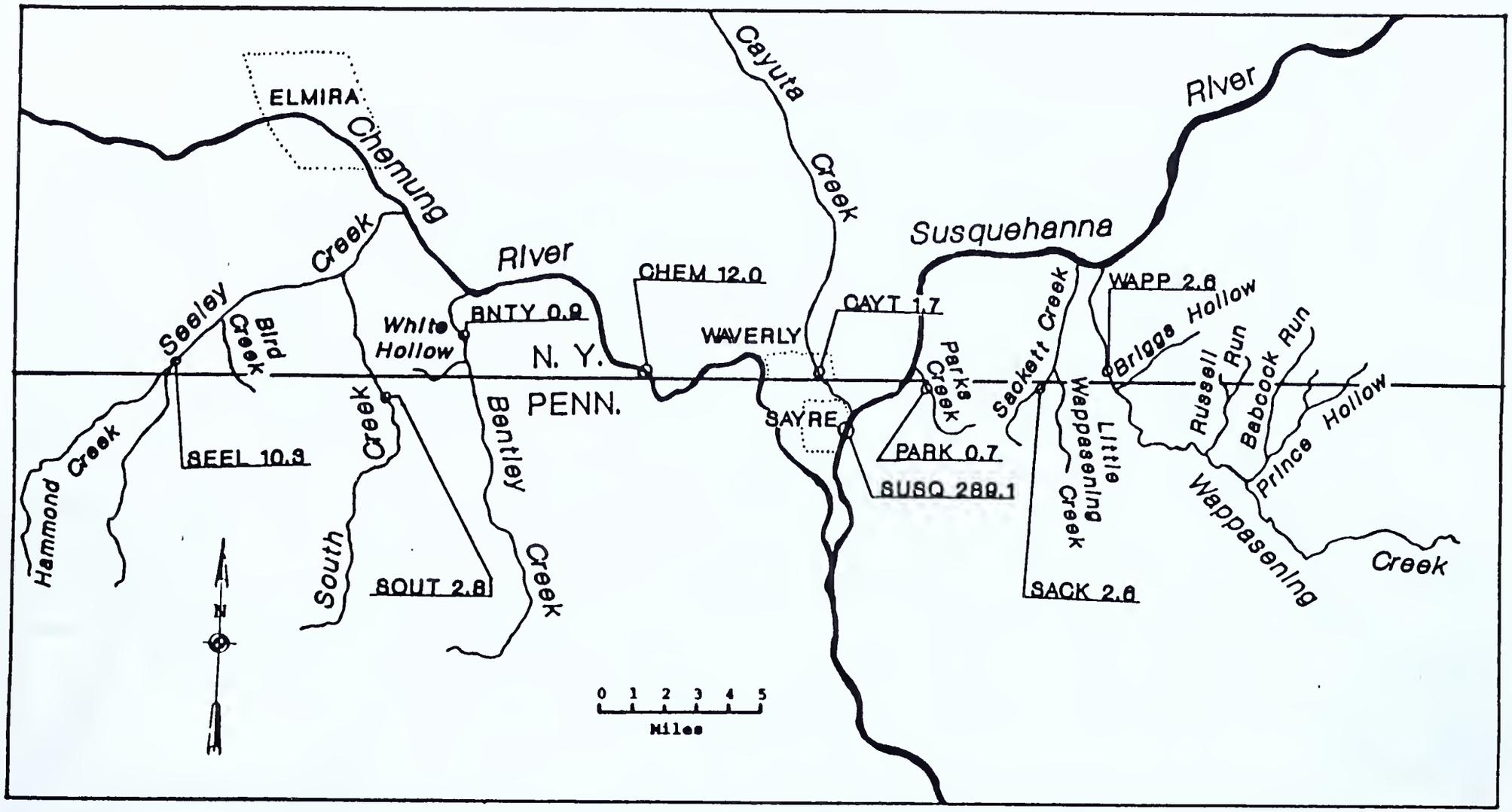


FIGURE 4 - Interstate Streams Along the New York/Pennsylvania Border Between Prince Hollow and Hammond Creek

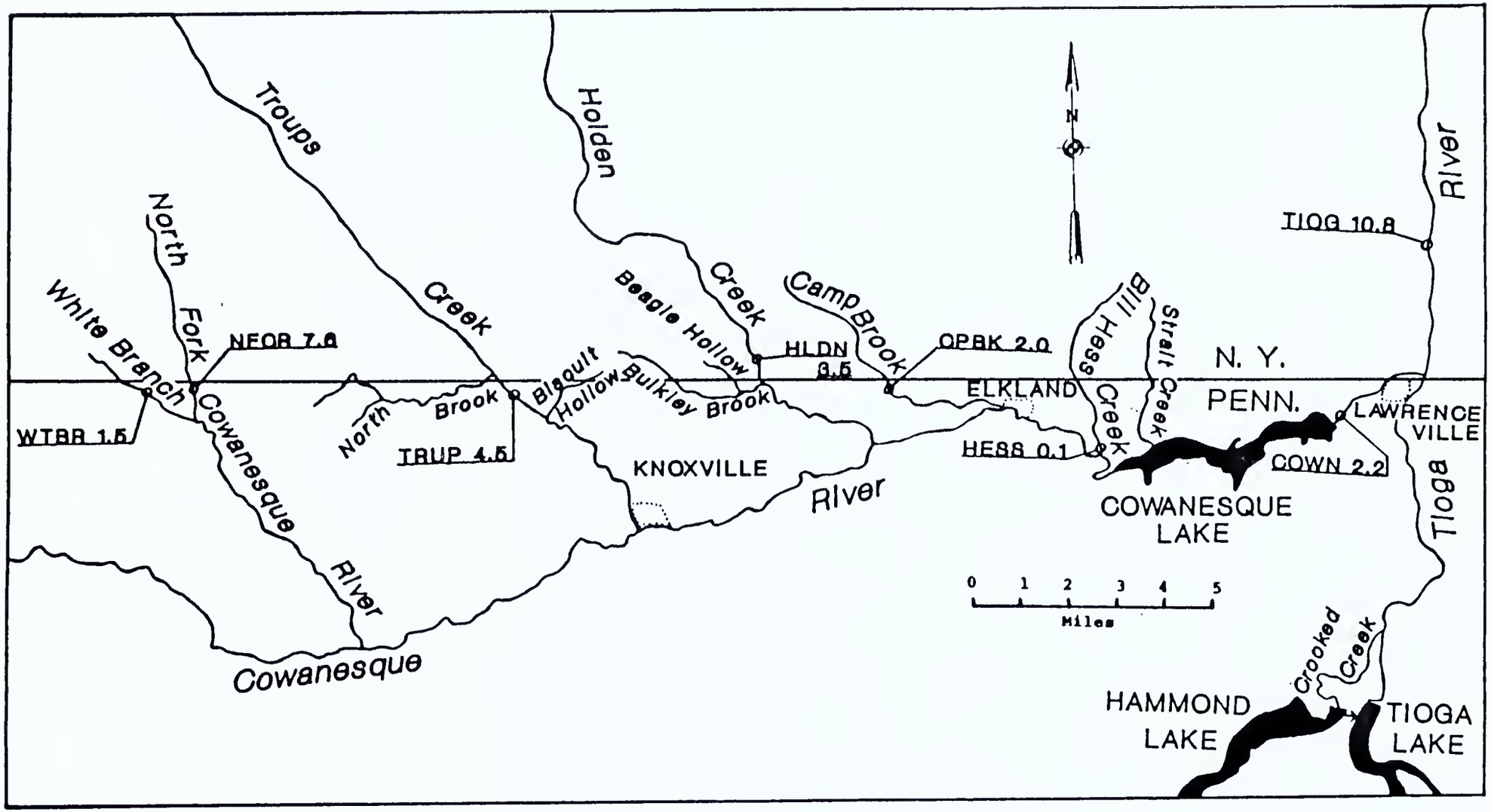


FIGURE 5 - Interstate Streams Along the New York/Pennsylvania Border Between the Tioga River and White Branch

METHODS

Sampling Frequency. Water samples were collected from Group 1 stations every quarter and from Group 2 stations once a year. Macroinvertebrates were collected from Group 1 and Group 2 stations once a year. No water samples or macronvertebrate collections were taken from Group 3 streams, however, all were visually inspected during WY 1989 for any signs of degradation.

Stream Discharge. Stream discharge was measured at most stations. Stations on the Susquehanna River at Windsor, Kirkwood, Sayre, Columbia, and Port Deposit; the Chemung River at Chemung; the Cowanesque River at Lawrenceville; and the Tioga River at Lindley are located near United States Geological Survey (USGS) stream gages. Stream discharges are reported from gage records as mean daily discharges in cubic feet per second (cfs). Instantaneous discharge was measured at the remaining stations at the time of sampling. In some instances, no discharge measurements were made because high stream flows made stream access impossible.

Water Samples. Chemical and physical parameters are listed in Table 3. Water samples were collected using depth integrating samplers. At each station, eight samples were collected by wading or from bridges using hand line samplers. These samples were combined in a churn splitter and churned to produce a composite sample for laboratory analysis.

Two liters of water were collected at each station for laboratory analysis. The samples consisted of two 500 ml bottles for nutrients (one filtered sample and one raw water sample), and two 500 ml bottles for metals analysis (also one filtered and one raw). Samples were filtered through a cellulose nitrate filter with a 0.45 micrometers pore size. Filters were changed at each station. All bottles were rinsed with sample water prior to filling and samples for metals analyses were fixed with nitric acid. The samples were chilled on ice and shipped to the Pennsylvania Department of Environmental Resources (PaDER), Bureau of Laboratories in Harrisburg, Pennsylvania.

Field Chemistry. Field tests were performed on churned water samples at the time of collection. Temperature and dissolved oxygen were measured using a YSI dissolved oxygen meter. Conductivity was measured using a Beckman Solu-bridge meter. pH was measured using an Orion Model 399A meter. Alkalinity was measured by titrating a known volume of water to pH 4.5 with 0.2N H_2SO_4. Acidity was measured by titrating a known volume of sample water to pH 8.3 with 0.2N NaOH. Total free chlorine was measured using a LaMotte 4497-DR Model PC7-DR chlorine test kit.

Macroinvertebrate Sampling. Benthic macroinvertebrates were sampled from Group 1 and 2 stations between July 25 and August 11, 1989. Macroinvertebrates are defined as aquatic

insects and other invertebrates that are too large to pass through a #30 sieve. Qualitative sampling (presence of macroinvertebrate taxa) was done using a kick screen. A riffle area was raked and the dislodged macroinvertebrates were collected in a seine stretched across the current. Macroinvertebrate specimens were collected and preserved in dilute formalin solution for later identification. This procedure was repeated until no new taxa were collected.

Relative abundance was measured by making quantitative collections with a Surber sampler. This device is a one foot square frame with a #30 mesh net. The sampler was placed on the substrate in a shallow riffle and the area enclosed by the frame was scrubbed with a brush. The current carried the dislodged macroinvertebrates into the net. Rocks within the frame were cleaned with a scrub brush to dislodge clinging or attached macroinvertebrates. The macroinvertebrates in the net were removed, placed in a container and preserved with dilute formalin solution. Three Surber samples were collected at each station. The preserved specimens were stored and identified to generic level at a later date.

Data Reduction. Results of laboratory analyses for chemical parameters were compared to state water quality standards. In addition, a simple water quality index (WQI) was used to make relative comparisons of water quality between stations and between sampling periods. This index was the average of the

percentile rank for each parameter per station. Percentile ranks were determined by compiling frequency curves using all the data generated by this monitoring program. The index ranges from 0 to 100, with higher scores indicating a higher proportion of parameters with relatively high concentrations.

Macroinvertebrate data was assessed using Rapid Bioassessment Protocols (Plafkin and others, 1989). These protocols improve interpretation of biological data by compiling a series of metrics which are then compared to a reference station. A relative score indicates varied degrees of impaired water quality. We used SNAK 2.3 (Snake Creek) as our reference station for streams along the New York-Pennsylvania border. Snake Creek had the best biological conditions and lies in a most typical area for the Northern Appalachian Plateau and Uplands Ecoregion (Omernik, 1987). For Pennsylvania-Maryland streams, we used SBCC 20.4 (South Branch Conewago Creek) as our reference station. South Branch Conewago Creek had the best biological conditions and is also in a most typical area for the Northern Piedmont Ecoregion.

TABLE 3

MONITORED PARAMETERS

Physical	STORET code
Discharge	00060
Temperature	00010
Chemical	
Field Analyses	
Conductivity	00095
Dissolved Oxygen	00300
pH	00400
Alkalinity	00410
Acidity	00435
Free chlorine	50064
Laboratory Analyses	
Biochemical Oxygen Demand	00310
Solids - Dissolved	00515
Total	00500
Ammonia as Nitrogen - Dissolved	00608
Total	00610
Nitrite as Nitrogen - Dissolved	00613
Total	00615
Nitrate as Nitrogen - Dissolved	00618
Total	00620
Kjeldahl Nitrogen - Dissolved	00623
Total	00625
Phosphorus - Dissolved	00666
Total	00665
Orthophosphate - Dissolved	00671
Total	70507
Organic Carbon - Total	00680
Calcium - Dissolved	00915
Total	00916
Magnesium - Dissolved	00925
Total	00927
Chloride - Dissolved	82295
Total	00940
Sulfate - Dissolved	00946
Total	00945
Iron - Dissolved	01046
Total	01045
Manganese - Dissolved	01056
Total	01055
Aluminum - Dissolved	01106
Total	01105

RESULTS

Water quality in most interstate streams meets designated uses and standards. Few chemical parameters exceed water quality standards and biological conditions in most streams are non-impaired or only slightly impaired. Only 39 out of 1460 observations failed to meet standards. Aluminum most commonly exceeded standards (Table 4 and Figure 6); other parameters were iron, manganese and pH.

Scott Creek at Delta, Pennsylvania continued to show signs of degraded water quality. In 1989, we collected 13 macroinvertebrate taxa, a depressed number, but a significant improvement over 1988 when we found no macroinvertebrates. However, macroinvertebrates are still moderately to severely impaired. Chemical parameters were very high in every sample; five observations exceeded standards. WQI values were extremely high during fall and winter and most parameters exceeded 90th percentiles, although only iron, manganese and aluminum exceeded standards. These samples were collected during drought conditions. Spring and summer were wetter and the increased stream flow may have diluted pollutants, thus accounting for the lowered WQI. However, all WQI values were much higher than most other streams. A local resident reported to us that untreated sewage was regularly discharged to the stream from residences in Cardiff, Maryland.

TABLE 4 - WATER QUALITY STANDARDS

PARAMETER	TOTAL OBS.	# > STD.	STANDARD
Dissolved aluminum	75	2	Pa. chronic fish.
Total aluminum	75	4	Pa. chronic fish.
		6	Pa. chronic fish and Md. acute fish.
		1	Pa./Md. acute fish.
		7	Pa./N.Y. chronic human and N.Y. chronic fish.
Dissolved iron	75	1	Pa. chronic human
		2	Pa./N.Y. chronic human and N.Y. chronic fish.
		7	Pa. chronic fish.
Total iron	75	7	Pa. chronic fish.
Dissolved manganese	75	2	Pa./N.Y. chronic human.
		1	N.Y. chronic fish.
Total manganese	75	2	Pa./N.Y. chronic human.
		1	N.Y. chronic fish.
pH	55	1	Pa./N.Y.
		2	Pa./Md.

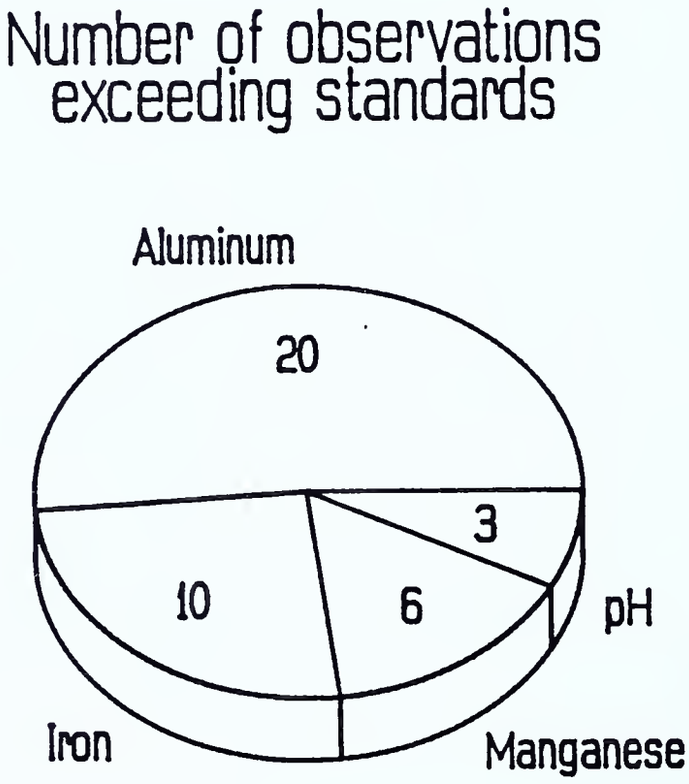


FIGURE 6 - Parameters Exceeding Water Quality Standards

Octoraro Creek at New Bridge, Maryland has had moderately impaired macroinvertebrates during the past two summers. High WQI values reflect elevated nutrient and metal concentrations. Aluminum, iron and pH exceeded standards at certain times.

The Susquehanna River at Sayre had WQI values averaging 11 points higher than at Kirkwood. We attribute this to waste water loads from the Binghamton-Owego area. No macroinvertebrate impairment was indicated.

The Tioga River at Lindley had high concentrations of sulfates and metals reflecting acid mine drainage pollution upstream. Even though the Tioga-Hammond project greatly improves water quality in the Tioga River, there is still a slight to moderate impairment of macroinvertebrates at the state line.

High WQI values and slight to moderate macroinvertebrate impairment in the Chemung River reflect waste water loads from Elmira.

Elevated nutrient and metal concentrations in Cayuta Creek may come from the Waverly sewage treatment plant, however no macroinvertebrate impairment was observed.

Falling Branch Deer Creek and Big Branch Deer Creek both showed moderately impaired macroinvertebrates. No specific cause was indicated by the water quality data.

Troups Creek showed moderately impaired macroinvertebrates. Although high turbidity was observed at the time of sampling, no specific cause was indicated by the water quality data.

The Cowanesque River showed moderate to severe macroinvertebrate impairment below Cowanesque Lake. This is due to increased phytoplankton production in the lake and a shift to a filter feeding community in the river downstream. Elevated concentrations of ammonia, nitrites and manganese may reflect reducing conditions in the lower depths of the lake.

Trowbridge Creek showed slight to moderate macroinvertebrate impairment despite very low concentrations of most chemical parameters. This could be caused by stream bed channelization and/or the dumping into the creek of grass clippings from chemically treated lawns. The latter was reported to us by a local resident during our field work.

Station summaries are presented in Tables 7 through 42. Included are listings of parameters exceeding water quality standards, WQI values and parameters that exceeded the 90th percentile at each station. Macroinvertebrate summaries and other comments are provided along with graphs showing historical comparisons for water quality and macroinvertebrate indices over the monitoring period.

ABBREVIATIONS FOR TABLES 5 THROUGH 40

ABBREV.	PARAMETER		ABBREV.	PARAMETER	
ACID	Acidity				
BOD	Biochemical O2 Demand				
COND	Conductivity				
DAl	Dissolved	Alumunim	TAl	Total	Aluminum
DCa	"	Calcium	TCa	"	Calcium
DCl	"	Chloride	TCl	"	Chloride
DFe	"	Iron	TFe	"	Iron
DKDN	"	Kjeldahl N.	TKDN	"	Kjeldahl N.
DMg	"	Magnesium	TMg	"	Magnesium
DMn	"	Manganese	TMn	"	Manganese
DNH3	"	Ammonia	TNH3	"	Ammonia
DNO2	"	Nitrite	TNO2	"	Nitrite
DNO3	"	Nitrate	TNO3	"	Nitrate
DP	"	Phosphorus	TP	"	Phosphorus
DPO4	"	Orthophos.	TPO4	"	Orthophos.
DS	"	Solids	TS	"	Solids
DSO4	"	Sulfate	TSO4	"	Sulfate
			TOC	"	Org. Carbon
WQI	Water Quality Index				
RBP	Rapid Bioassessment Protocol				

TABLE 5 - SUSQ 44.5

WATER QUALITY SUMMARY
SUSQUEHANNA RIVER AT COLUMBIA

PARAMETERS EXCEEDING STANDARDS

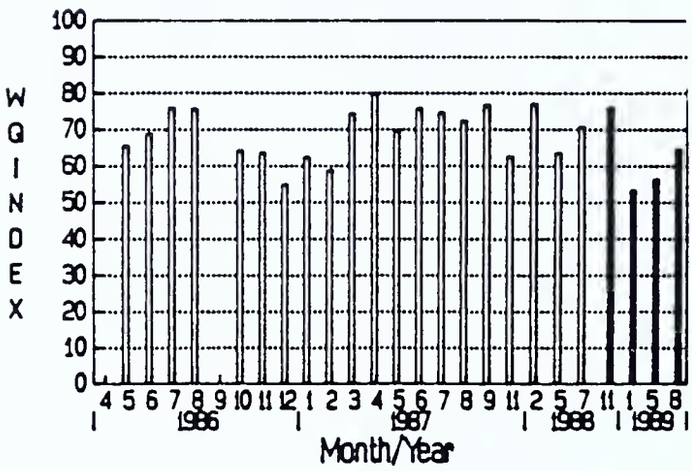
PARAMETER	DATE	VALUE	STANDARD	STATE
DAl	05/15/89	720 ug/l	500 ug/l	Pa. chronic fish
TAl	05/15/89	2,190 ug/l	500 ug/l	Pa. chronic fish
"	"	"	750 ug/l	Md. acute fish
TFe	"	2,260 ug/l	1,500 ug/l	Pa. chronic fish
pH	08/10/89	8.70	8.50	Md. and Pa.

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/03/88	66	COND DCl TCl DSO4 TSO4
02/01/89	55	DSO4 DAl
05/15/89	53	DMn TMn DAl TAl
08/10/89	64	COND DS TS DCa TCa DSO4

BIOLOGICAL SUMMARY

Number of taxa: 23
Diversity Index: 3.42
RBP Score: 38
RBP Condition: Non-impaired

Water Quality Index



Biological Index

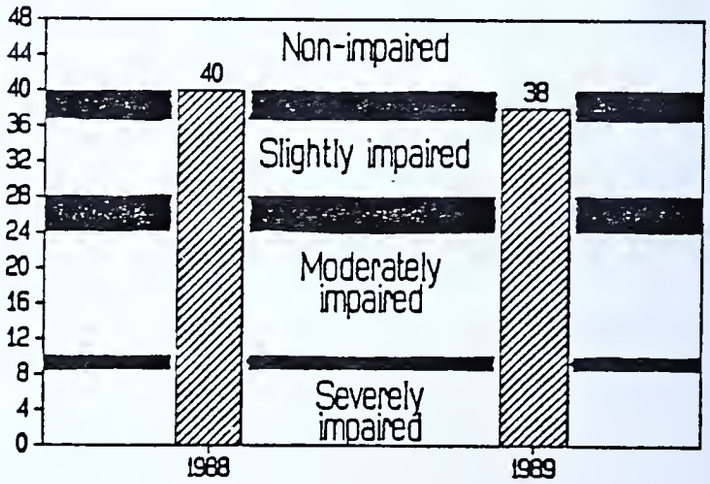


TABLE 6 - SUSQ 4.8

WATER QUALITY SUMMARY
SUSQUEHANNA RIVER AT PORT DEPOSIT, MARYLAND

PARAMETERS EXCEEDING STANDARDS

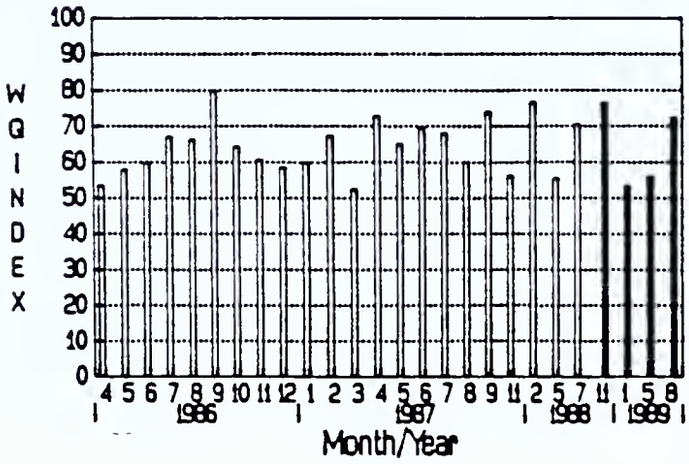
PARAMETER	DATE	VALUE	STANDARD	STATE
DAl	05/15/89	690 ug/l	500 ug/l	Pa. chronic fish
TAl	"	1,400 ug/l	500 ug/l	Pa. chronic fish
TAl	"	"	750 ug/l	Md. chronic fish
TFe	"	1,890 ug/l	1,500 ug/l	Pa. chronic fish
TAl	08/10/89	610 ug/l	500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/03/88	76	COND ACID DS DNH3 TNH3 DNO2 DMg TMg DCa TCa DCl TCl DSO4 TSO4
02/02/89	53	
05/15/89	55	TMn DAl TAl
08/15/89	72	TAl

BIOLOGICAL SUMMARY

No data

Water Quality Index



Biological Index

No data

TABLE 7 - DEER 44.2

WATER QUALITY SUMMARY
DEER CREEK

PARAMETERS EXCEEDING STANDARDS

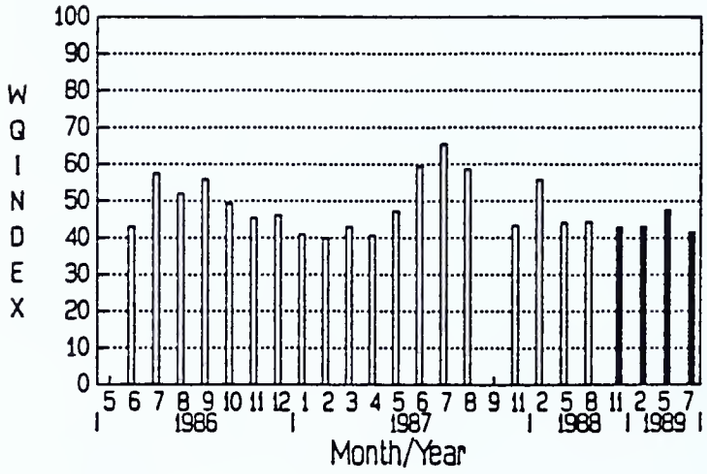
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	05/18/89	680 ug/l	500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
10/31/88	43	
01/30/89	43	
05/17/89	48	
08/09/89	42	

BIOLOGICAL SUMMARY

Number of taxa:	23
Diversity Index:	3.72
RBP Score:	38
RBP Condition:	Non-impaired

Water Quality Index



Biological Index

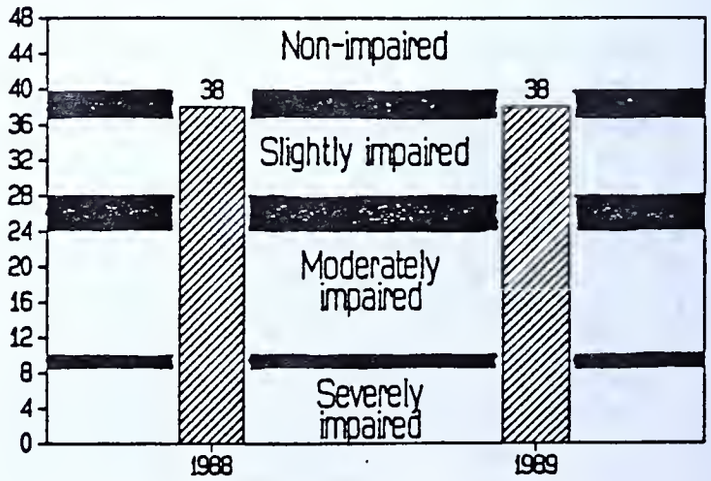


TABLE 8 - EBAU 1.5

WATER QUALITY SUMMARY
EBAUGHS CREEK

PARAMETERS EXCEEDING STANDARDS

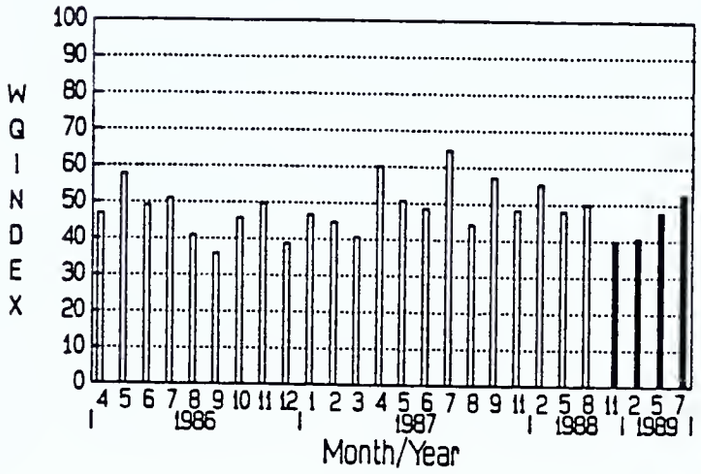
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	05/18/89	850 ug/l	500 ug/l	Pa. chronic fish
"	"	"	750 ug/l	Md. acute fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/02/88	40	
02/01/89	41	DNO3 TNO3 DAl
05/18/89	48	DAl
07/24/89	53	DNO3 TNO3

BIOLOGICAL SUMMARY

Number of taxa: 20
Diversity Index: 2.90
RBP Score: 30
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

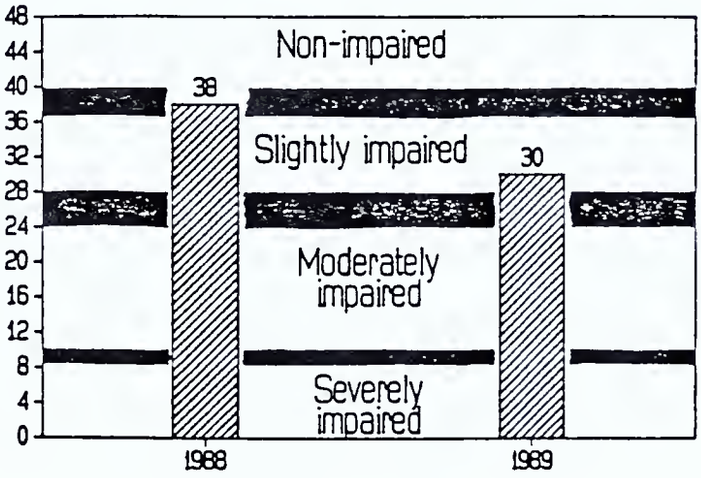


TABLE 9 - SCTT 3.0

WATER QUALITY SUMMARY
SCOTT CREEK

PARAMETERS EXCEEDING STANDARDS

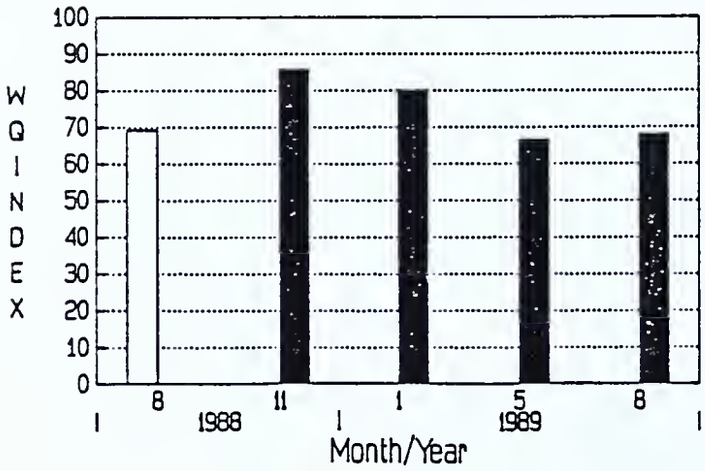
PARAMETER	DATE	VALUE	STANDARD	STATE
DFe	11/02/88	1,790 ug/l	300 ug/l	Pa. chronic human
TFe	11/02/88	4,120 ug/l	1,500 ug/l	Pa. chronic fish
DMn	11/02/88	1,520 ug/l	1,000 ug/l	Pa. chronic fish
TMn	11/02/88	1,550 ug/l	1,000 ug/l	Pa. chronic fish
TAl	02/01/89	640 ug/l	500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/02/88	86	COND BOD ACID TOC DNH3 TNH3 DNO2 DKDN TKDN TPO4 DP TP DMg TMg DCl TCl DFe TFe DMn TMn
02/01/89	80	COND DS TS DNH3 TNH3 DNO2 TNO2 DKDN TKDN DMg TMg DCl TCl DMn TMn
05/18/89	67	DPO4 DCl TCl
07/25/89	68	DNH3 TNH3 DNO2 TNO2 DCl TCl

BIOLOGICAL SUMMARY

Number of taxa: 13
Diversity Index: 2.34
RBP Score: 12
RBP Condition: Moderately impaired

Water Quality Index



Biological Index

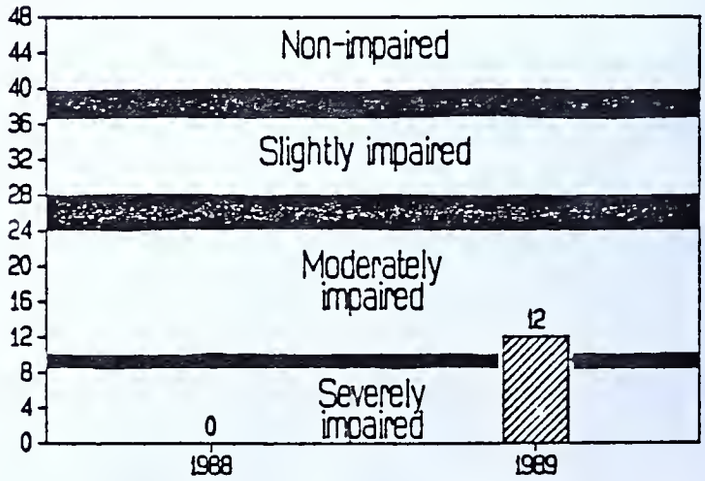


TABLE 10 - CNWG 4.4

WATER QUALITY SUMMARY
CONOWINGO CREEK

PARAMETERS EXCEEDING STANDARDS

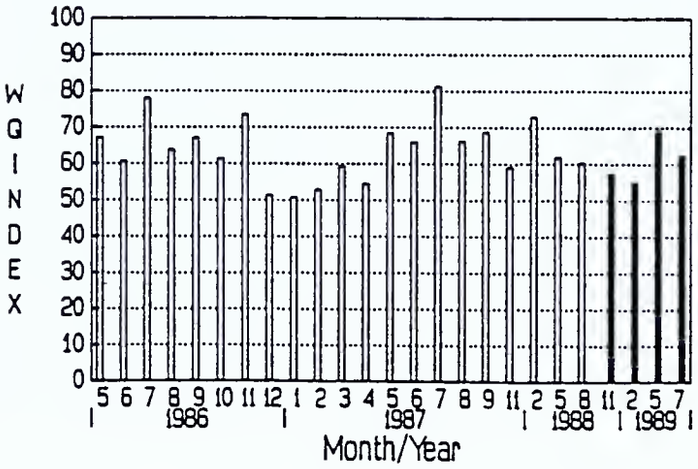
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	05/18/89	990 ug/l	500 ug/l	Pa. chronic fish
"	"	"	750 ug/l	Md. acute fish
TAl	07/26/89	650 ug/l	500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/03/88	57	ACID DNO3 TNO3
02/01/89	55	DNO3 TNO3
05/18/89	69	DNO2 TNO2 DNO3 TNO3 DPO4 TPO4 DP
07/26/89	60	DNO2 DNO3 TNO3

BIOLOGICAL SUMMARY

Number of taxa: 18
Diversity Index: 3.65
RBP Score: 32
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

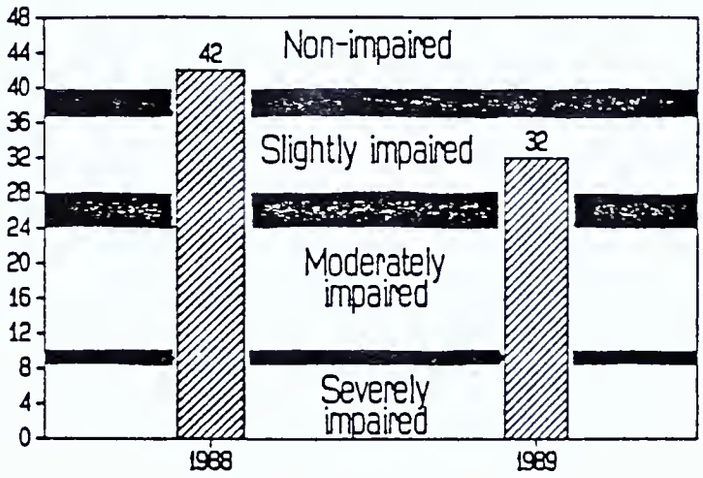


TABLE 11 - OCTO 6.6

WATER QUALITY SUMMARY
OCTORARO CREEK

PARAMETERS EXCEEDING STANDARDS

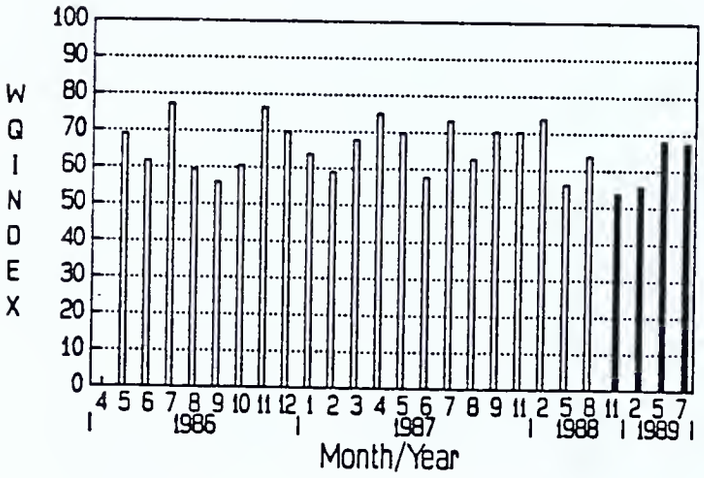
PARAMETER	DATE	VALUE	STANDARD	STATE
pH	02/01/89	8.60	8.50	Pa. and Md.
TAl	05/18/89	1,490 ug/l	500 ug/l	Pa. chronic fish
"	"	"	750 ug/l	Md. acute fish
"	07/26/89	2,960 ug/l	500 ug/l	Pa. chronic fish
"	"	"	2,500 ug/l	Pa. acute fish
"	"	"	750 ug/l	Md. acute fish
TFe	07/26/89	3,320 ug/l	1,500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/02/88	52	
02/01/89	56	DNO3 DMg TMg DAl
05/18/89	66	BOD DNO2 TNO2 TKDN TP
07/26/89	68	TKDN TPO4 DP TP TFe DAl TAl

BIOLOGICAL SUMMARY

Number of taxa: 20
Diversity Index: 2.55
RBP Score: 20
RBP Condition: Moderately impaired

Water Quality Index



Biological Index

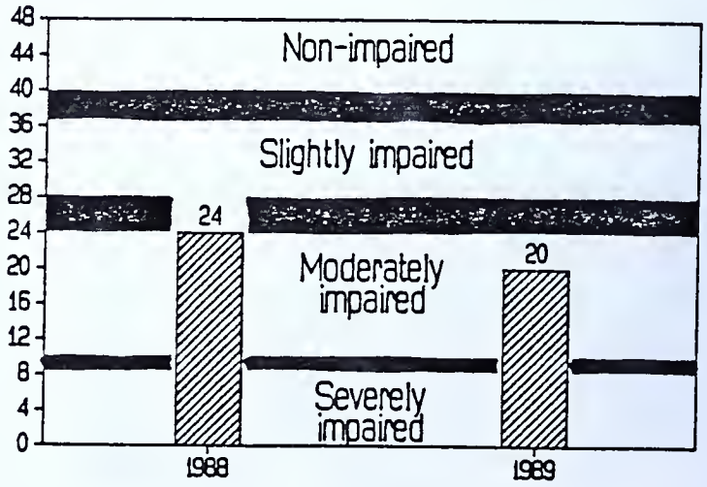


TABLE 12 - SUSQ 365.0

WATER QUALITY SUMMARY
SUSQUEHANNA RIVER AT WINDSOR, NEW YORK

PARAMETERS EXCEEDING STANDARDS

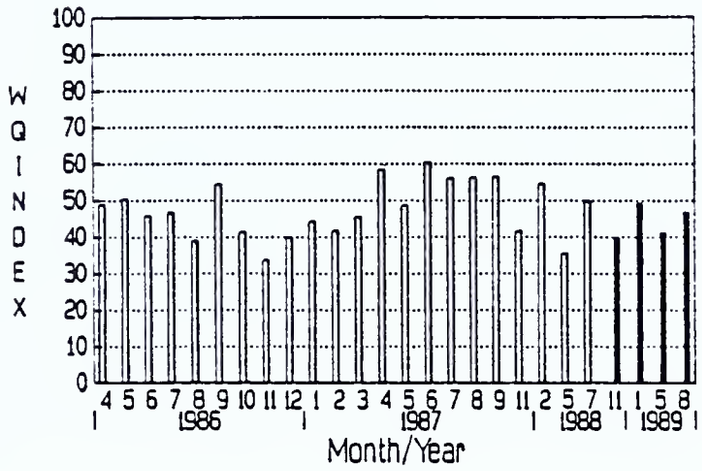
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
10/31/88	40	
01/30/89	49	
05/17/89	40	
08/09/89	47	

BIOLOGICAL SUMMARY

Number of taxa:	26
Diversity Index:	3.90
RBP Score:	42
RBP Condition:	Non-impaired

Water Quality Index



Biological Index

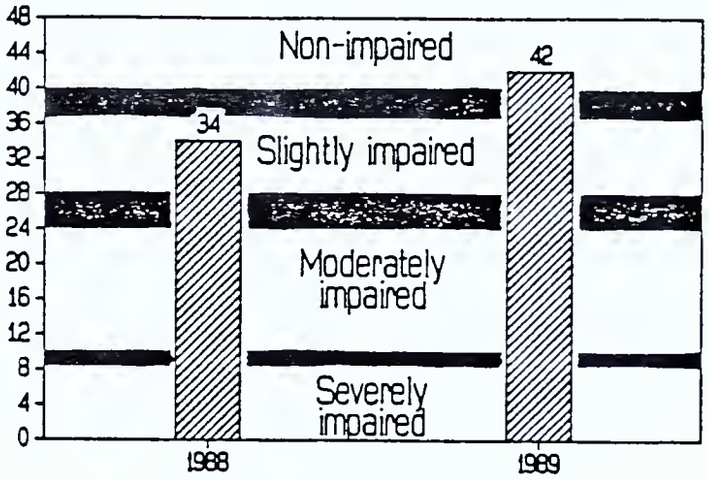


TABLE 13 - SUSQ 340.0

WATER QUALITY SUMMARY

PARAMETERS EXCEEDING STANDARDS

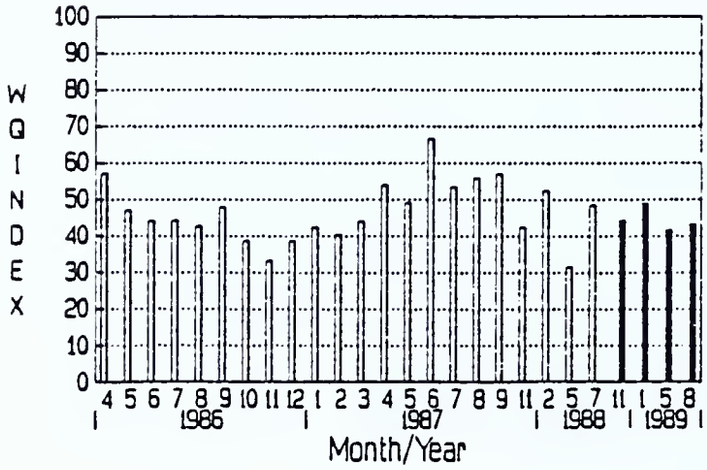
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
10/31/88	44	
01/30/89	49	
05/17/89	42	
08/09/89	43	

BIOLOGICAL SUMMARY

Number of taxa: 30
Diversity Index: 3.50
RBP Score: 36
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

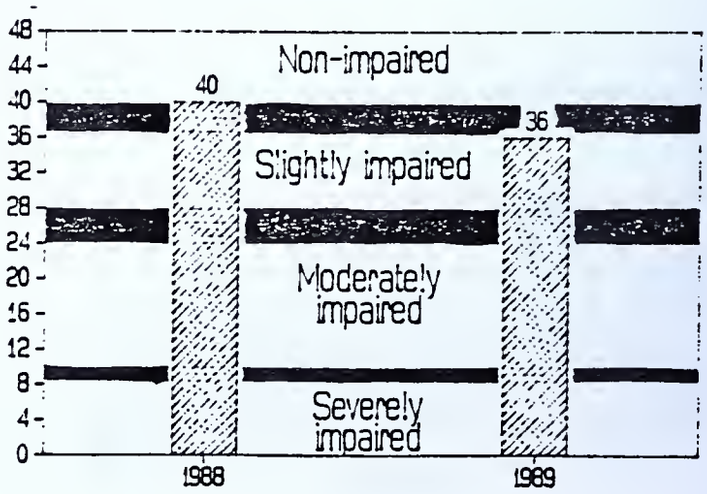


TABLE 14 - SUSQ 289.1

WATER QUALITY SUMMARY
SUSQUEHANNA RIVER AT SAYRE, PENNSYLVANIA

PARAMETERS EXCEEDING STANDARDS

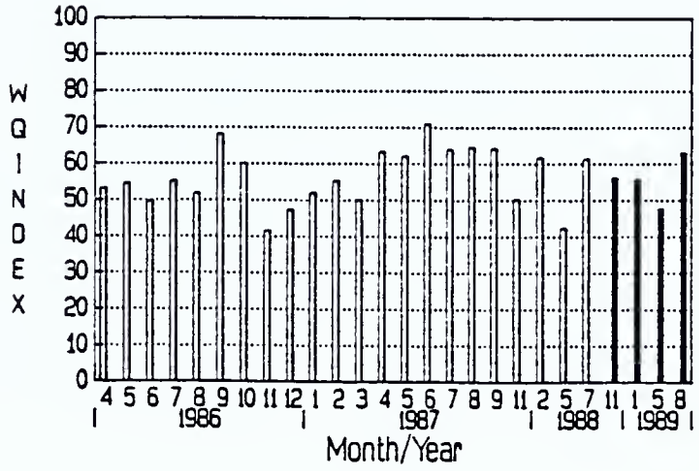
PARAMETER	DATE	VALUE	STANDARD	STATE
pH	01/30/89	8.80	8.50	N.Y. and Pa.
TAl	05/16/89	1,000 ug/l	500 ug/l	N.Y. and Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
10/31/88	56	
01/30/89	56	DNH3
05/16/89	48	ACID TAl
08/07/89	63	DS TS DPO4 DP DCa TCa DCl TCl

BIOLOGICAL SUMMARY

Number of taxa: 24
Diversity Index: 3.61
RBP Score: 44
RBP Condition: Non-impaired

Water Quality Index



Biological Index

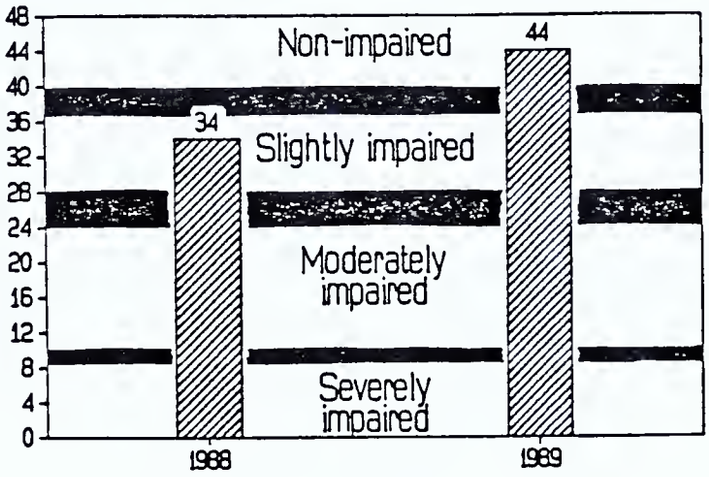


TABLE 15 - TIOG 10.8

WATER QUALITY SUMMARY
TIOGA RIVER

PARAMETERS EXCEEDING STANDARDS

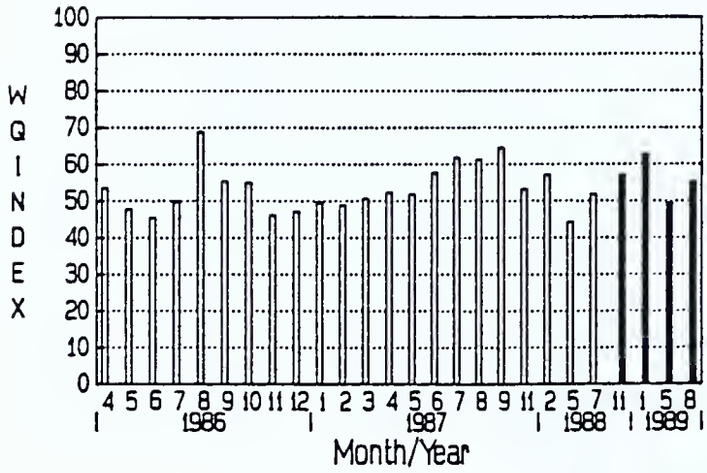
PARAMETER	DATE	VALUE	STANDARD	STATE
DMn	11/01/88	800 ug/l	300 ug/l	N.Y. chronic fish
"	01/31/89	1,120 ug/l	"	"
"	"	"	1,000 ug/l	Pa. chronic fish
TMn	11/01/88	830 ug/l	300 ug/l	N.Y. chronic fish
"	01/31/89	1,170 ug/l	"	"
"	"	"	1,000 ug/l	Pa. chronic fish
TAl	05/16/89	1,160 ug/l	500 ug/l	Pa. and N.Y. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/01/88	57	COND DMg TMg DSO4 TSO4 DMn TMn
01/31/89	63	DNH3 DSO4 TSO4 DMn TMn
05/16/89	49	DMn TMn TAl
08/01/89	55	DSO4 TSO4 DMn

BIOLOGICAL SUMMARY

Number of taxa: 17
Diversity Index: 2.96
RBP Score: 24
RBP Condition: Moderately impaired

Water Quality Index



Biological Index

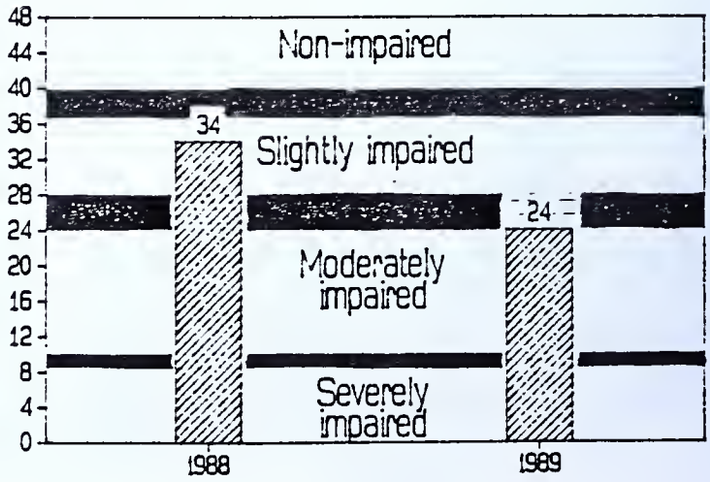


TABLE 16 - CHEM 12.0

WATER QUALITY SUMMARY
CHEMUNG RIVER

PARAMETERS EXCEEDING STANDARDS

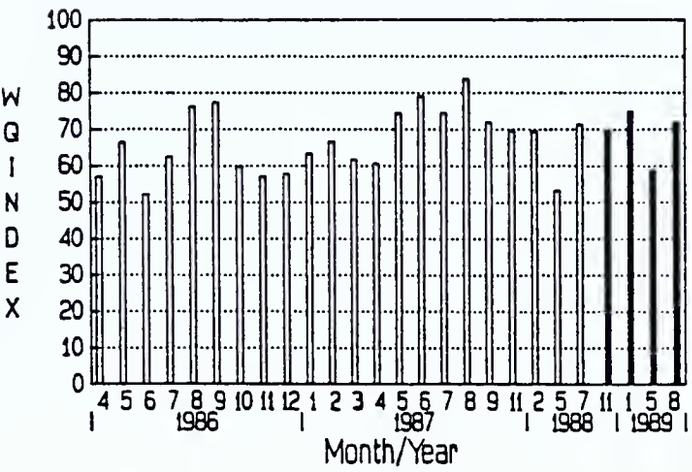
PARAMETER	DATE	VALUE	STANDARD	STATE
TAL	05/16/89	870 ug/l	500 ug/l	Pa. and N.Y. chronic fish
TFe	05/16/89	1,900 ug/l	1,500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/01/88	70	COND DS TS TOC DPO4 DP DCa TCa DMg TMg DCl TCl
01/31/89	75	COND DS TS DPO4 TPO4 DCa TCa DMg TMg DCl TCl
05/16/89	59	TS TPO4 TP
08/07/89	72	COND DS TS TKDN DPO4 DP DCa TCa TMg DCl TCl TSO4

BIOLOGICAL SUMMARY

Number of taxa: 27
Diversity Index: 3.00
RBP Score: 28
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

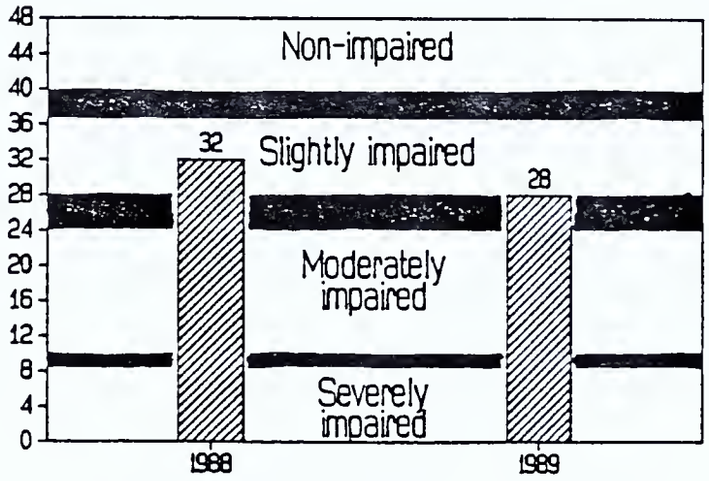


TABLE 17 - CAYT 1.7

WATER QUALITY SUMMARY
CAYUTA CREEK

PARAMETERS EXCEEDING STANDARDS

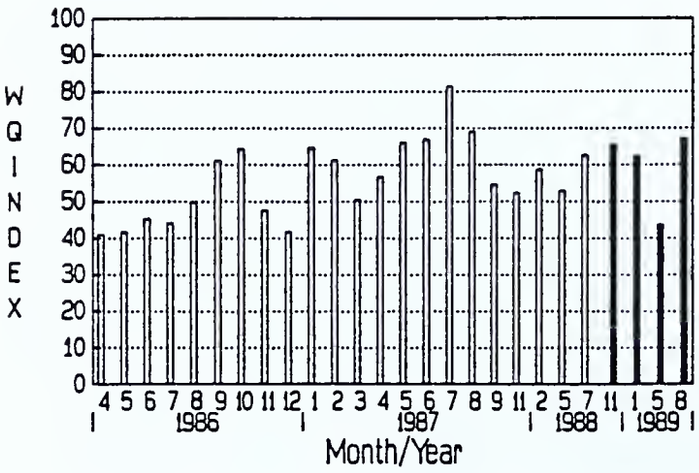
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	05/16/89	2,340 ug/l	500 ug/l	Pa. and N.Y. chronic fish
TFe	05/16/89	2,940 ug/l	1,500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
11/01/88	65	COND ACID DPO4 TPO4 DP TP DCa TCa DCl TCl
01/31/89	62	DPO4 TPO4 DP TCa DCl TCl
05/16/89	44	TAl
08/07/89	68	COND DS TS DPO4 TPO4 DP TP DCa TCa DCl TCl DSO4

BIOLOGICAL SUMMARY

Number of taxa: 21
Diversity Index: 3.53
RBP Score: 44
RBP Condition: Non-impaired

Water Quality Index



Biological Index

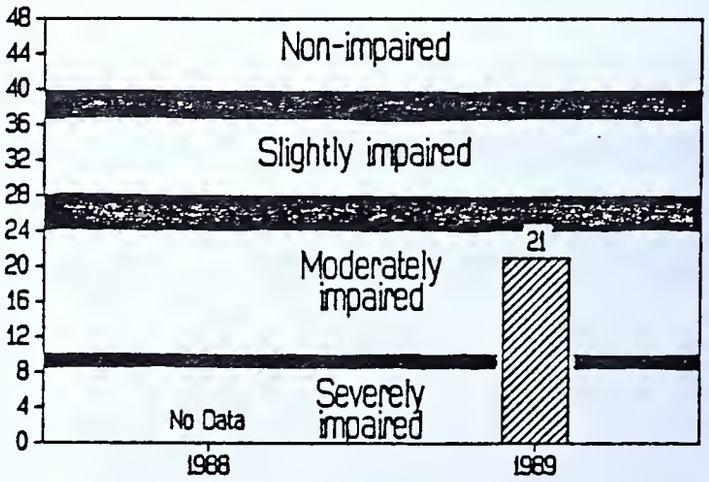


TABLE 18 - LNGA 2.5

WATER QUALITY SUMMARY
LONG ARM CREEK

PARAMETERS EXCEEDING STANDARDS

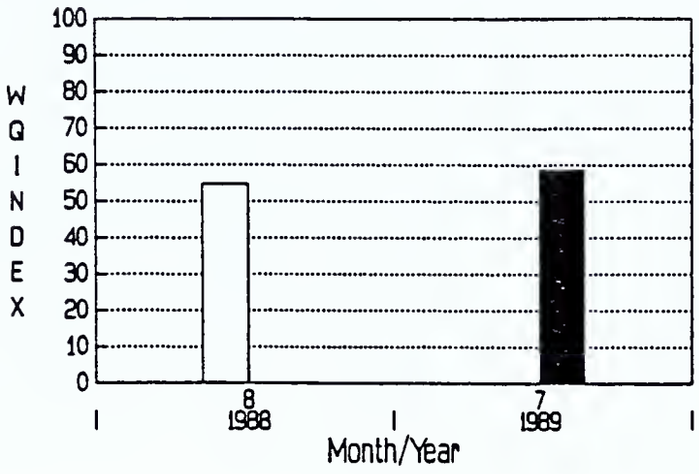
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	07/24/89	800 ug/l	500 ug/l	Pa. chronic fish
"	"	"	750 ug/l	Md. acute fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
07/24/89	59	DNO3 TNO3 DKDN TKDN

BIOLOGICAL SUMMARY

Number of taxa: 18
Diversity Index: 3.28
RBP Score: 32
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

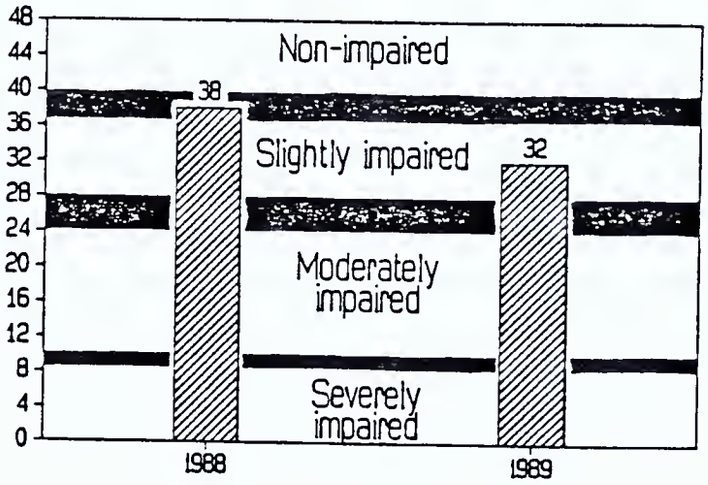


TABLE 19 - SBCC 20.4

WATER QUALITY SUMMARY
SOUTH BRANCH CONEWAGO CREEK

PARAMETERS EXCEEDING STANDARDS

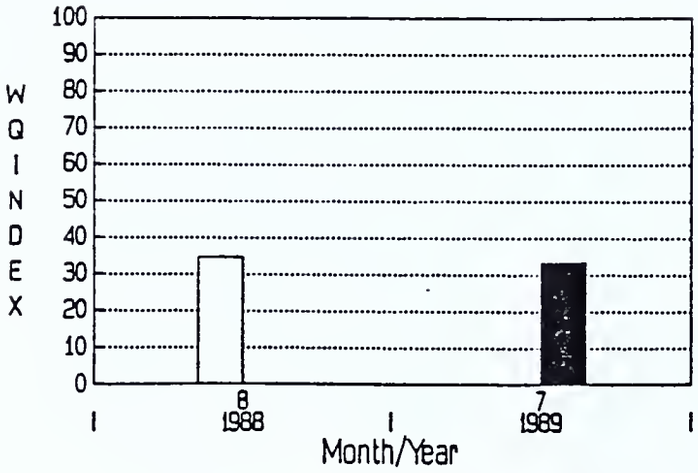
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
07/24/89	33	

BIOLOGICAL SUMMARY

Number of taxa: 24
Diversity Index: 3.39
RBP Score: 44 (reference station)
RBP Condition: Non-impaired

Water Quality Index



Biological Index

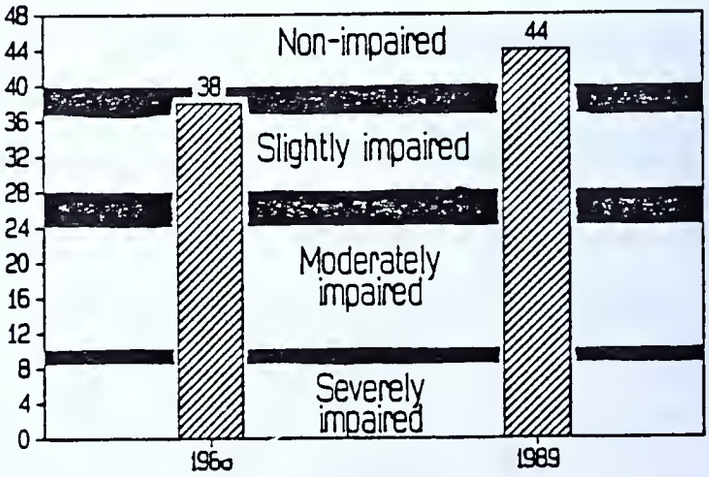


TABLE 20 - BBDC 4.1

WATER QUALITY SUMMARY
BIG BRANCH DEER CREEK

PARAMETERS EXCEEDING STANDARDS

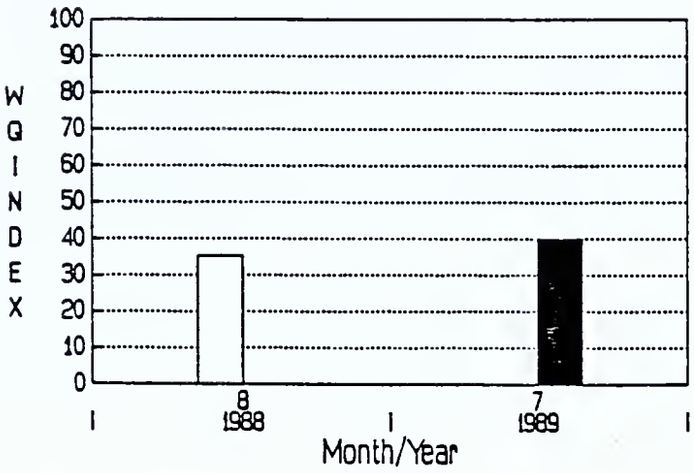
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
07/25/89	40	DNO3

BIOLOGICAL SUMMARY

Number of taxa: 18
Diversity Index: 3.20
RBP Score: 26
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

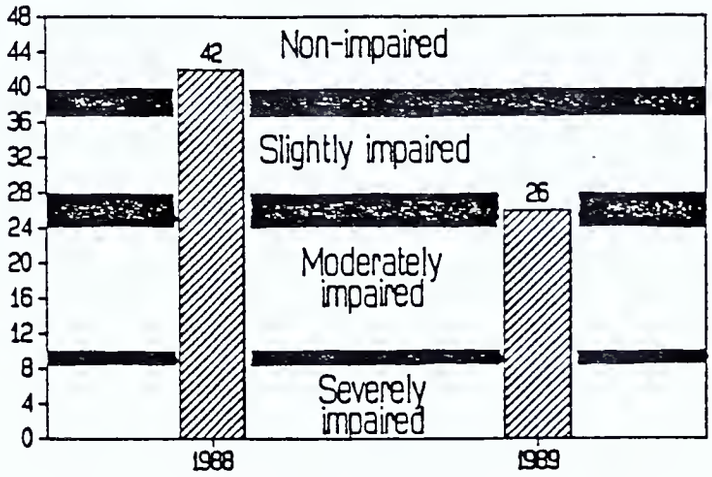


TABLE 21 - FBDC 4.1

WATER QUALITY SUMMARY
FALLING BRANCH CREEK

PARAMETERS EXCEEDING STANDARDS

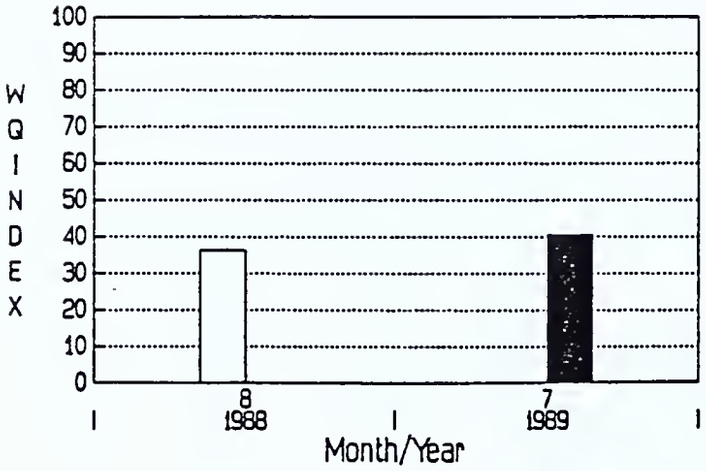
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
07/25/89	41	

BIOLOGICAL SUMMARY

Number of taxa: 15
Diversity Index: 2.65
RBP Score: 20
RBP Condition: Moderately impaired

Water Quality Index



Biological Index

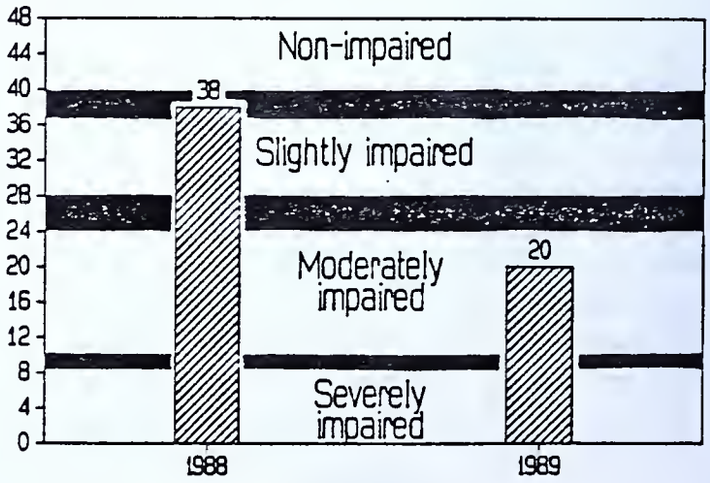


TABLE 22 - CASC 1.6

WATER QUALITY SUMMARY
CASCADE CREEK

PARAMETERS EXCEEDING STANDARDS

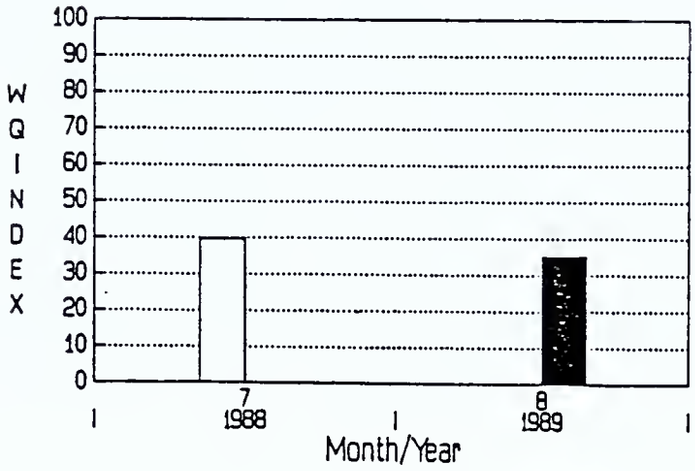
PARAMETER	DATE	VALUE	STANDARD	STATE
DFe	08/09/89	800 ug/l	300 ug/l	N.Y. and Pa. chronic human and N.Y. chronic fish
TFe	08/09/89	1,690 ug/l	1,500 ug/l	Pa. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/09/89	35	DFe DMn TMn

BIOLOGICAL SUMMARY

Number of taxa: 22
Diversity Index: 2.80
RBP Score: 34
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

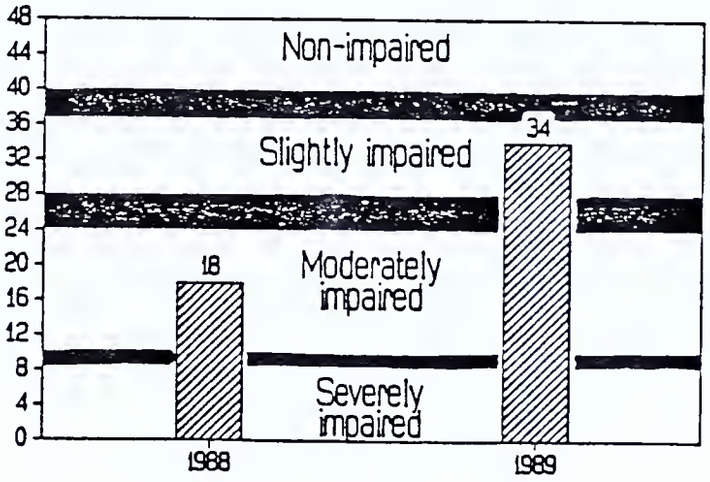


TABLE 23 - TROW 1.8

WATER QUALITY SUMMARY
TROWBRIDGE CREEK

PARAMETERS EXCEEDING STANDARDS

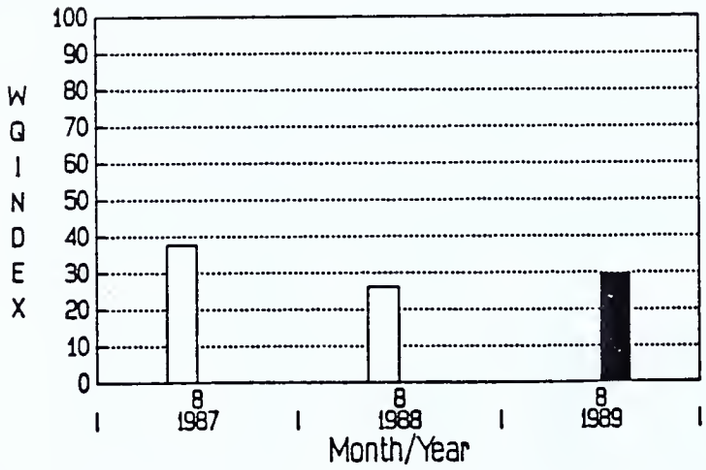
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/09/89	27	TP

BIOLOGICAL SUMMARY

Number of taxa: 24
Diversity Index: 3.23
RBP Score: 26
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

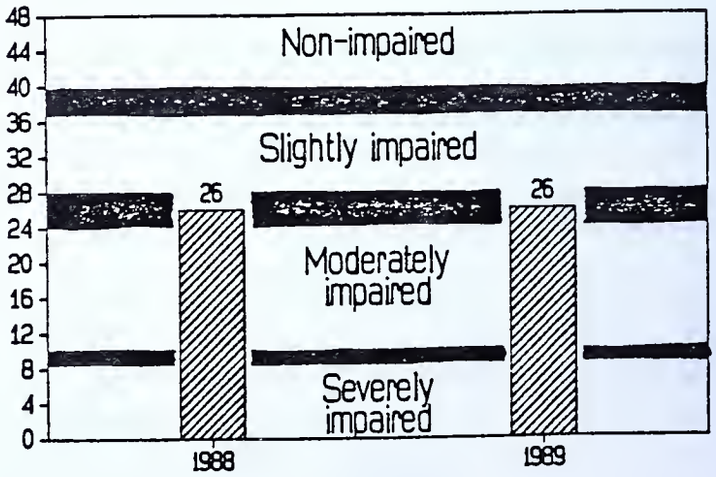


TABLE 24 - SNAK 2.3

WATER QUALITY SUMMARY
SNAKE CREEK

PARAMETERS EXCEEDING STANDARDS

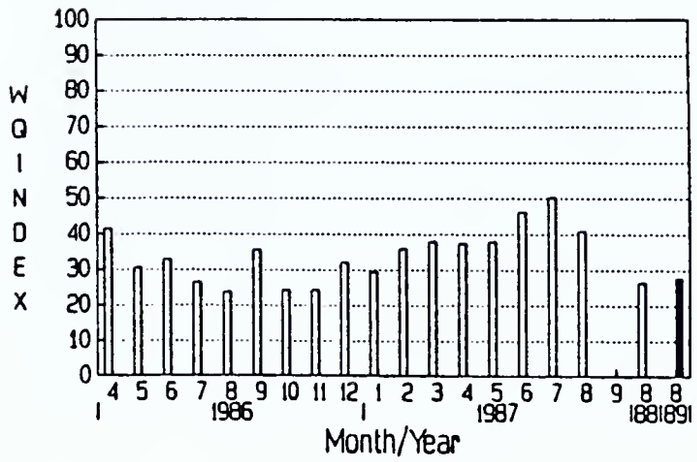
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/09/89	28	

BIOLOGICAL SUMMARY

Number of taxa: 25
Diversity Index: 4.04
RBP Score: 48 (reference station)
RBP Condition: Non-impaired

Water Quality Index



Biological Index

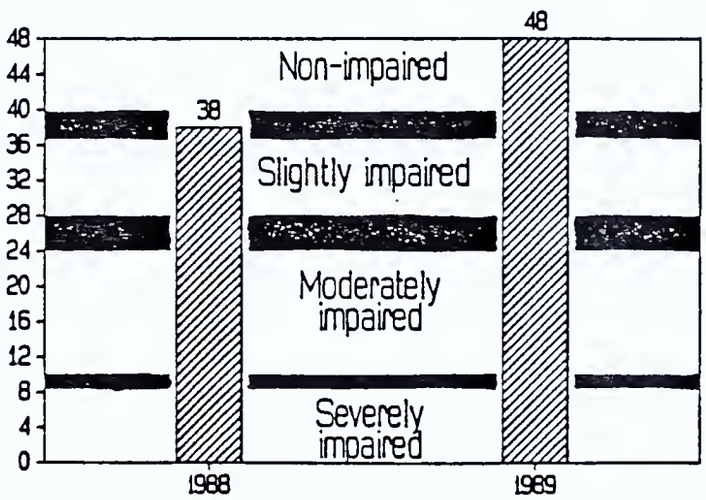


TABLE 25 - LSNK 7.6

WATER QUALITY SUMMARY
LITTLE SNAKE CREEK

PARAMETERS EXCEEDING STANDARDS

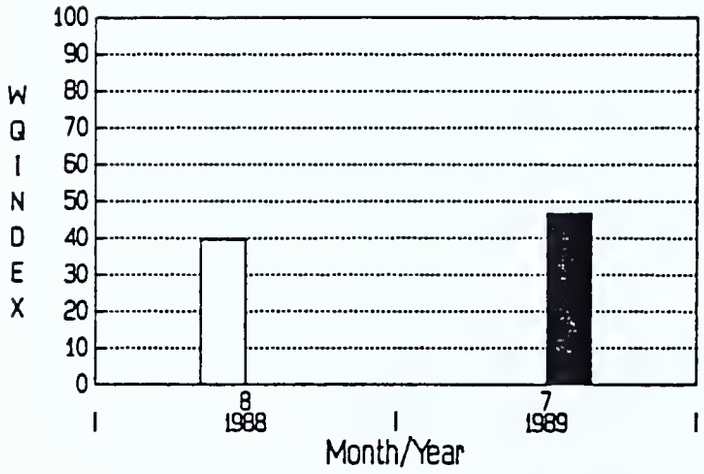
PARAMETER	DATE	VALUE	STANDARD	STATE
DFe	08/08/89	700 ug/l	300 ug/l	N.Y. and Pa. chronic human and N.Y. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/08/89	47	DFe DMn DAl

BIOLOGICAL SUMMARY

Number of taxa:	30
Diversity Index:	4.03
RBP Score:	40
RBP Condition:	Non-impaired

Water Quality Index



Biological Index

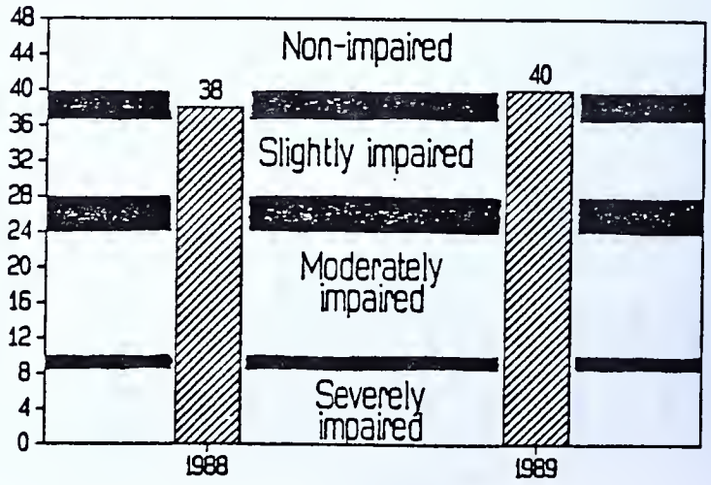


TABLE 26 - CHOC 9.1

WATER QUALITY SUMMARY
CHOCONUT CREEK

PARAMETERS EXCEEDING STANDARDS

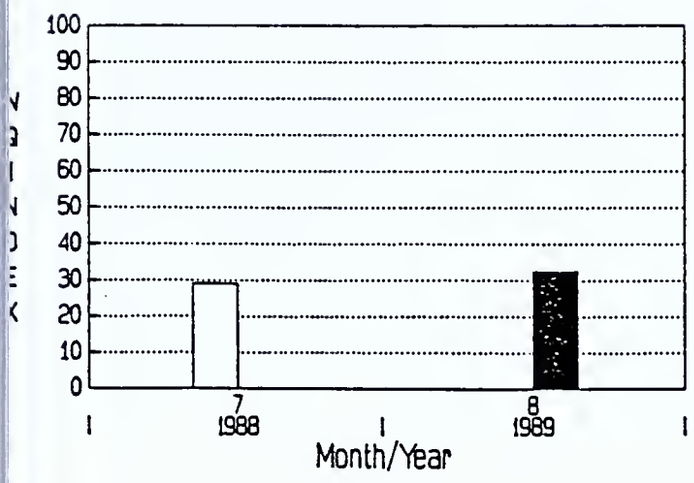
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/08/89	32	TSO4

BIOLOGICAL SUMMARY

Number of taxa:	22
Diversity Index:	3.54
RBP Score:	40
RBP Condition:	Non-impaired

Water Quality Index



Biological Index

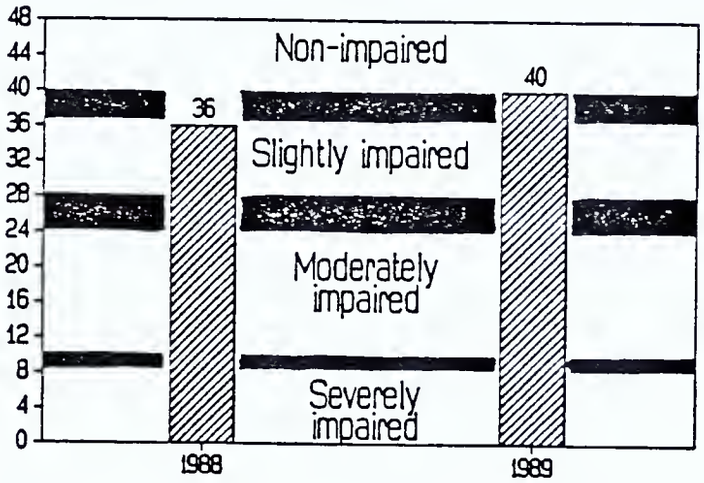


TABLE 27 - APAL 6.9

WATER QUALITY SUMMARY
APALACHIN CREEK

PARAMETERS EXCEEDING STANDARDS

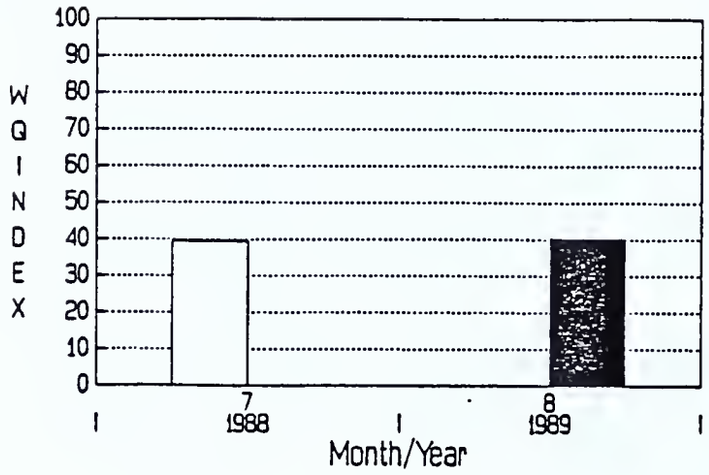
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/08/89	40	

BIOLOGICAL SUMMARY

Number of taxa: 20
Diversity Index: 3.58
RBP Score: 36
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

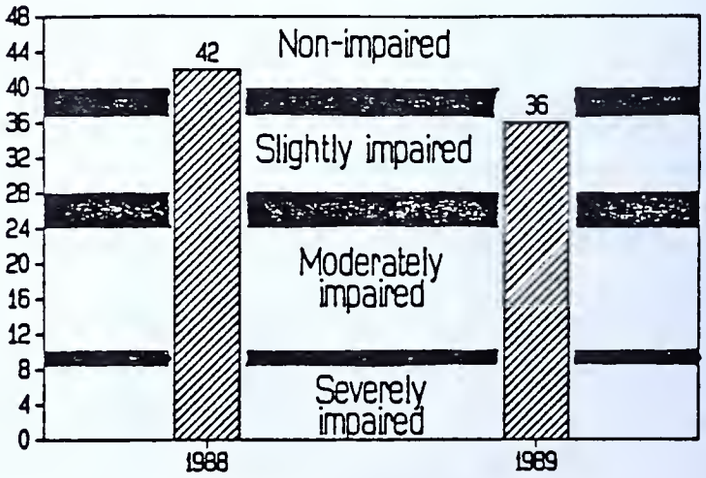


TABLE 28 - WAPP 2.6

WATER QUALITY SUMMARY
WAPPASENING CREEK

PARAMETERS EXCEEDING STANDARDS

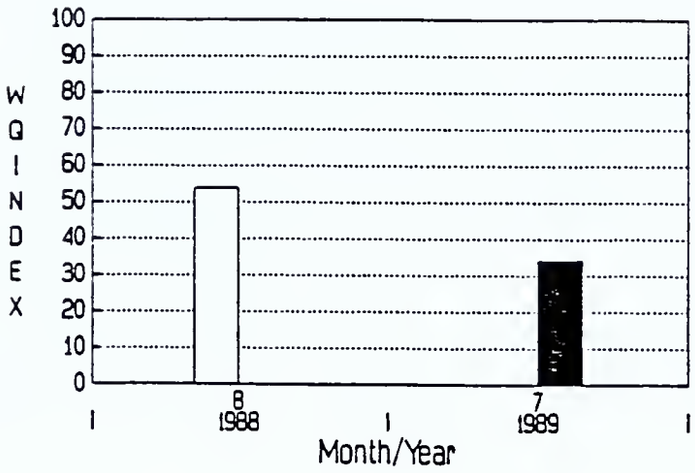
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/08/89	35	

BIOLOGICAL SUMMARY

Number of taxa: 24
Diversity Index: 3.85
RBP Score: 42
RBP Condition: Non-impaired

Water Quality Index



Biological Index

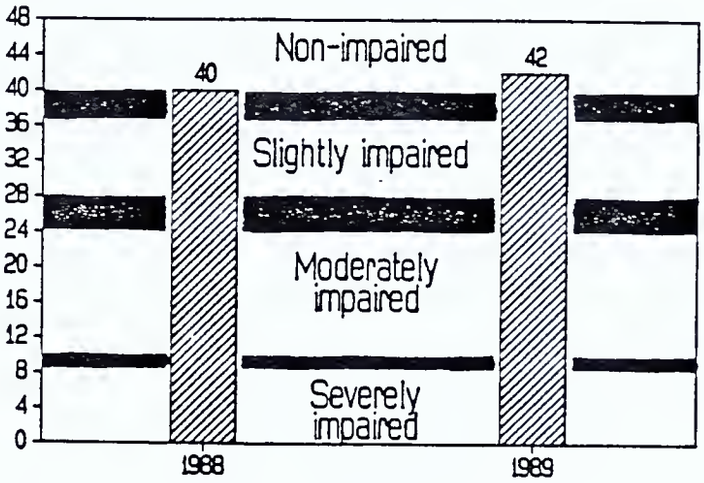


TABLE 29 - SACK 2.6

WATER QUALITY SUMMARY
SACKETT CREEK

PARAMETERS EXCEEDING STANDARDS

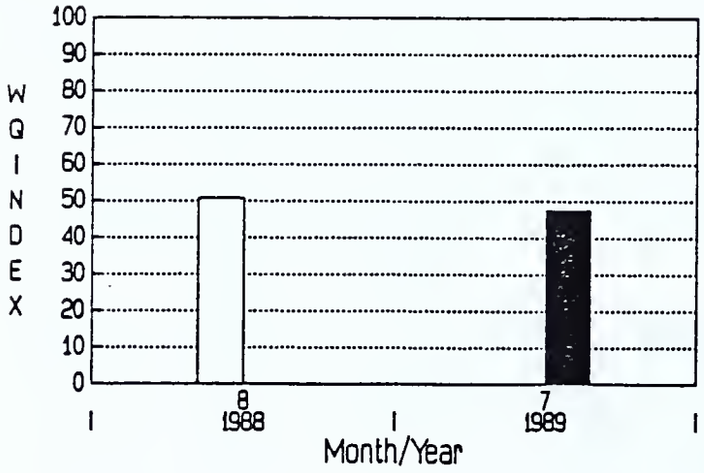
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/08/89	48	

BIOLOGICAL SUMMARY

Number of taxa: 16
Diversity Index: 2.89
RBP Score: 26
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

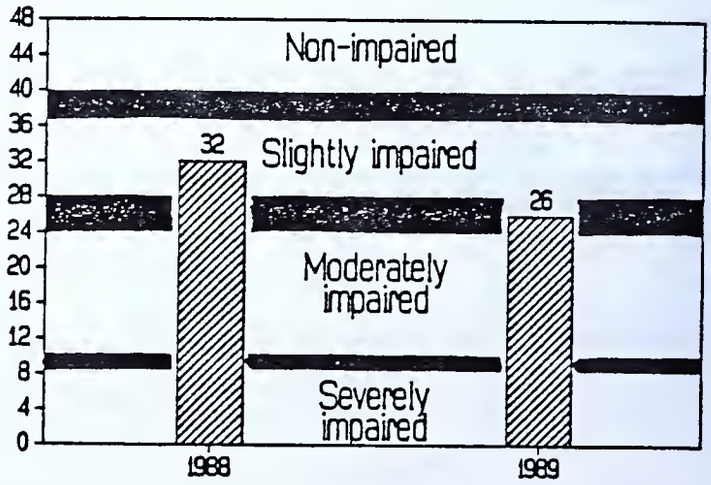


TABLE 30 - PARK 0.7

WATER QUALITY SUMMARY
PARKS CREEK

PARAMETERS EXCEEDING STANDARDS

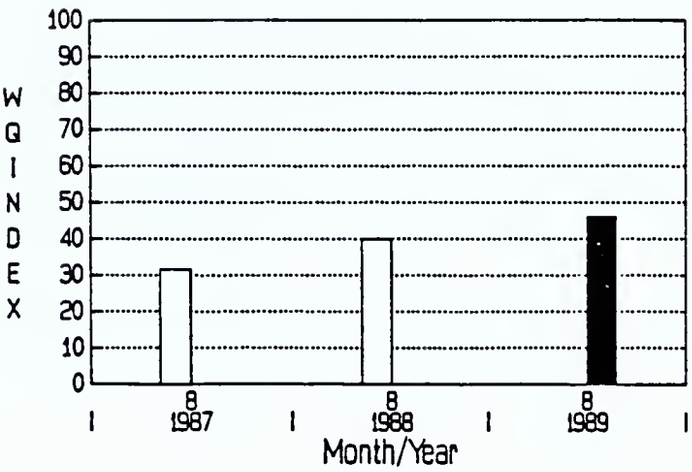
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/07/89	45	TSO4

BIOLOGICAL SUMMARY

Number of taxa:	27
Diversity Index:	3.82
RBP Score:	42
RBP Condition:	Non-impaired

Water Quality Index



Biological Index

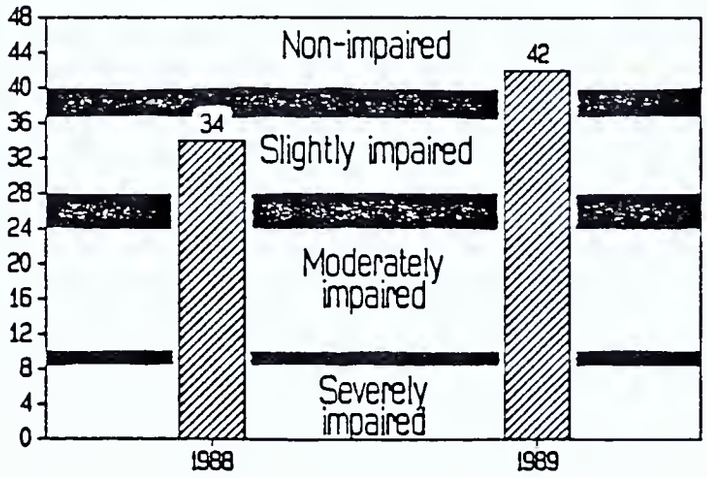


TABLE 31 - BNTY 0.9

WATER QUALITY SUMMARY
BENTLEY CREEK

PARAMETERS EXCEEDING STANDARDS

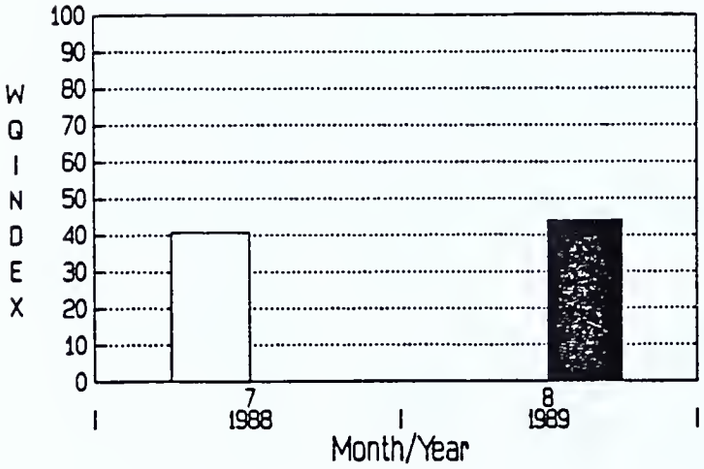
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/02/89	44	

BIOLOGICAL SUMMARY

Number of taxa: 20
Diversity Index: 3.50
RBP Score: 32
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

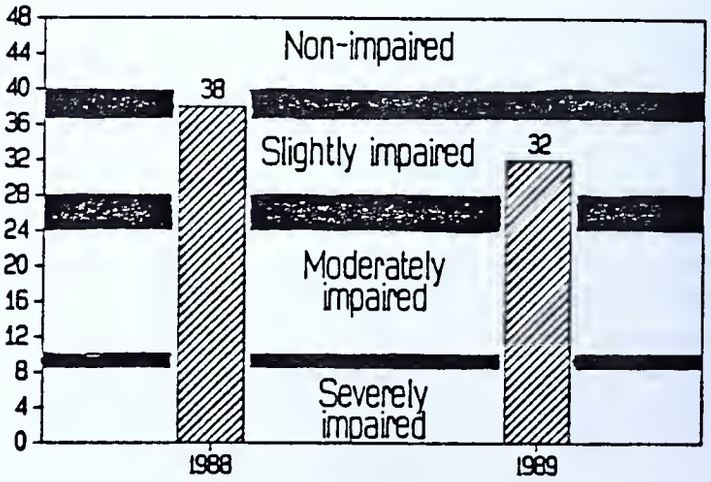


TABLE 32 - SOUT 2.8

WATER QUALITY SUMMARY
SOUTH CREEK

PARAMETERS EXCEEDING STANDARDS

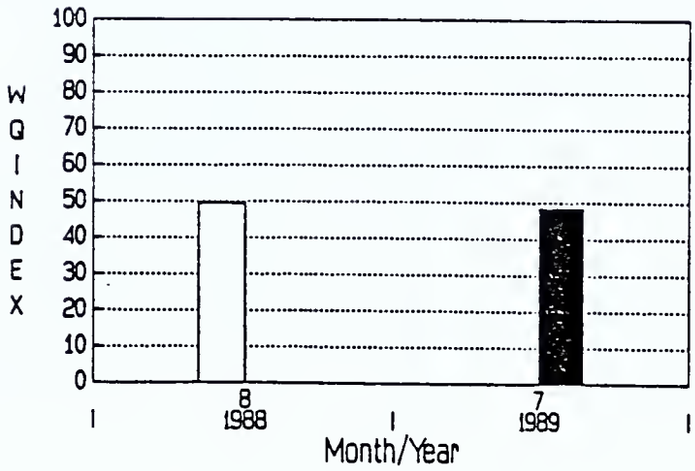
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/02/89	49	

BIOLOGICAL SUMMARY

Number of taxa: 34
Diversity Index: 4.02
RBP Score: 46
RBP Condition: Non-impaired

Water Quality Index



Biological Index

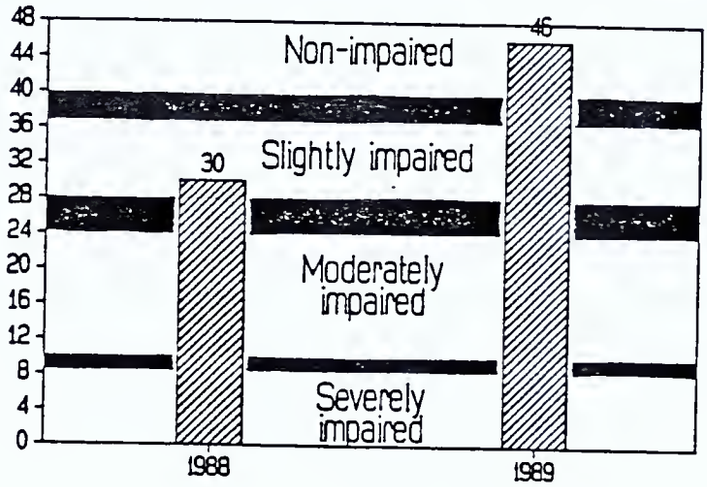


TABLE 33 - SEEL 10.3

WATER QUALITY SUMMARY
SEELEY CREEK

PARAMETERS EXCEEDING STANDARDS

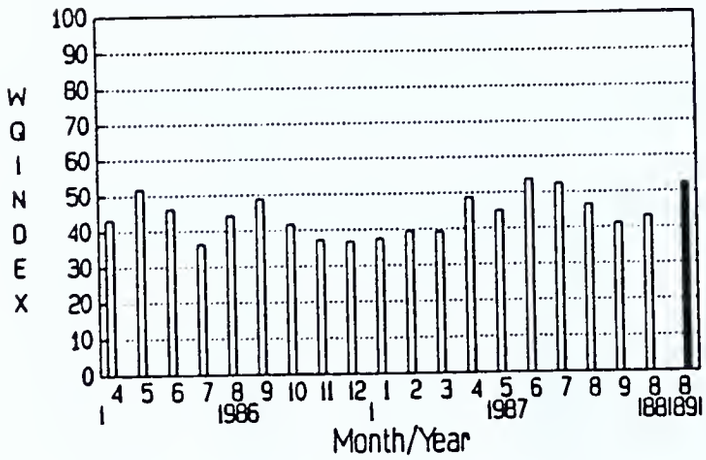
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/02/89	52	DCa TCa

BIOLOGICAL SUMMARY

Number of taxa: 24
Diversity Index: 2.90
RBP Score: 32
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

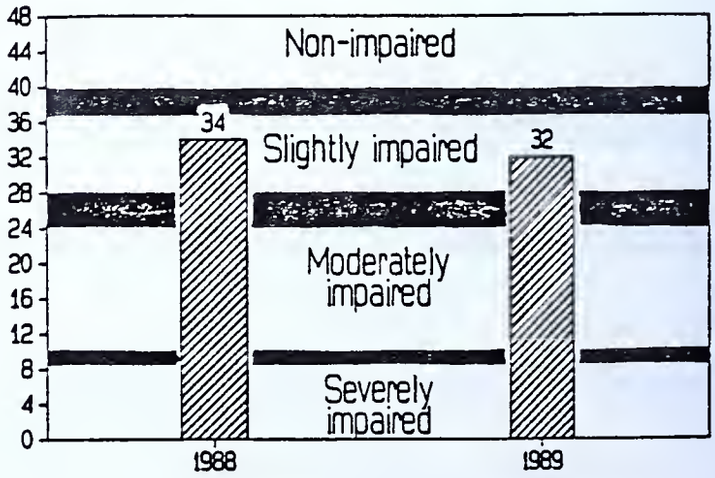


TABLE 34 - COWN 2.2

WATER QUALITY SUMMARY
COWANESQUE RIVER

PARAMETERS EXCEEDING STANDARDS

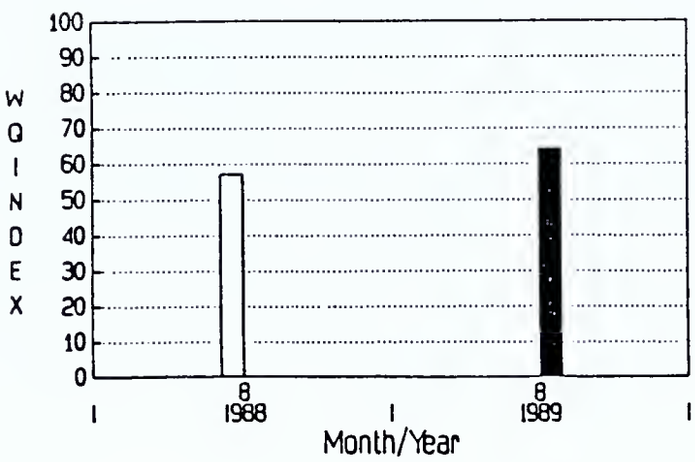
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/01/89	64	DNH3 DNO2 TNO2 DMn TMn

BIOLOGICAL SUMMARY

Number of taxa: 11
Diversity Index: 1.72
RBP Score: 10
RBP Condition: Moderate to severely impaired

Water Quality Index



Biological Index

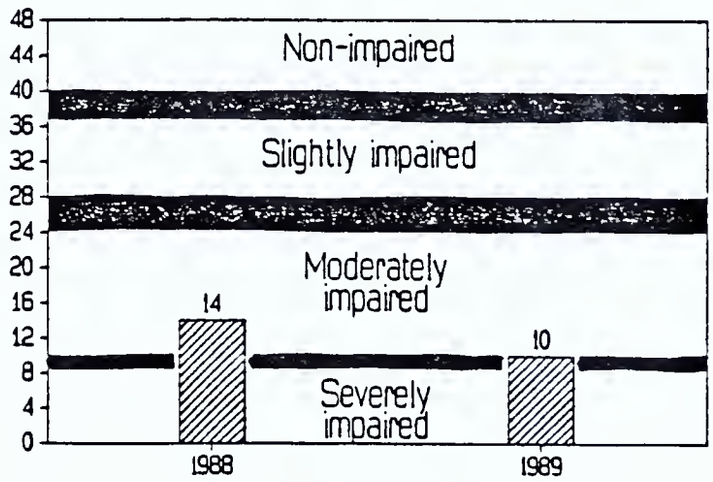


TABLE 35 - HESS 0.1

WATER QUALITY SUMMARY
BILL HESS CREEK

PARAMETERS EXCEEDING STANDARDS

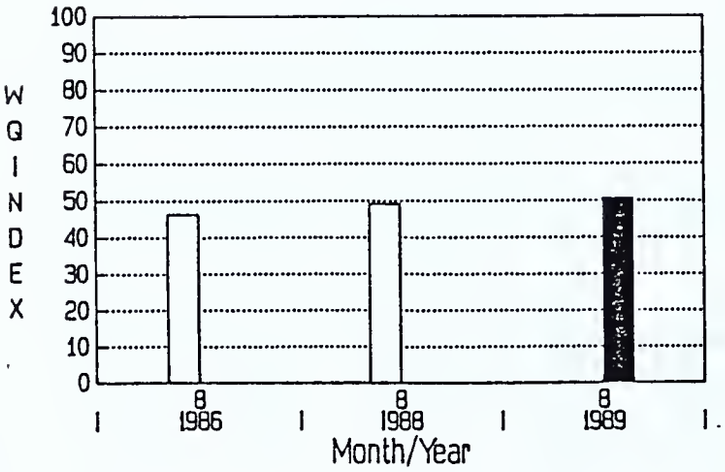
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	08/01/89	550 ug/l	500 ug/l	Pa. and N.Y. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/01/89	51	COND DS DCa TCa DMg TMg DSO4 TSO4

BIOLOGICAL SUMMARY

Number of taxa: 22
Diversity Index: 3.28
RBP Score: 32
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

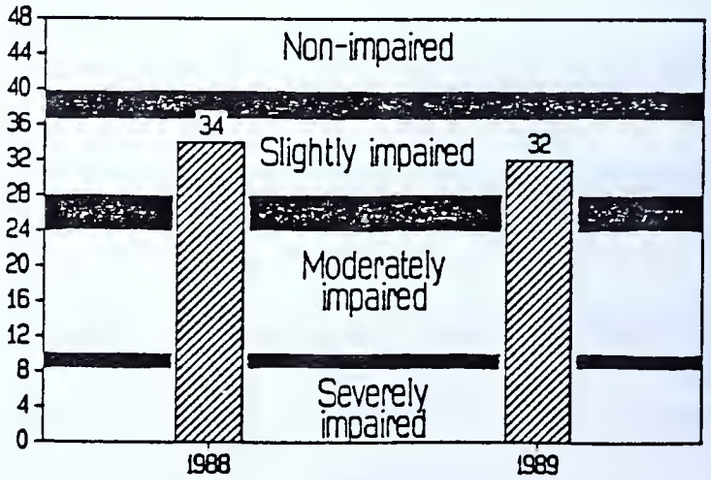


TABLE 36 - CPBK 2.0

WATER QUALITY SUMMARY
CAMP BROOK

PARAMETERS EXCEEDING STANDARDS

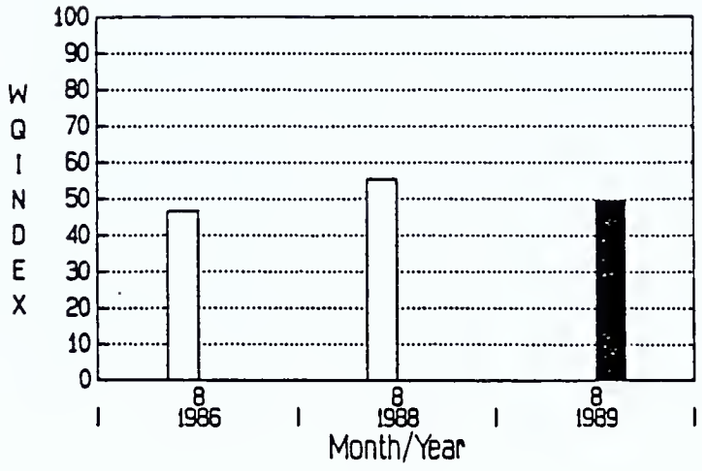
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/01/89	50	COND DCa TCa DMg TMg

BIOLOGICAL SUMMARY

Number of taxa: 18
Diversity Index: 3.38
RBP Score: 34
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

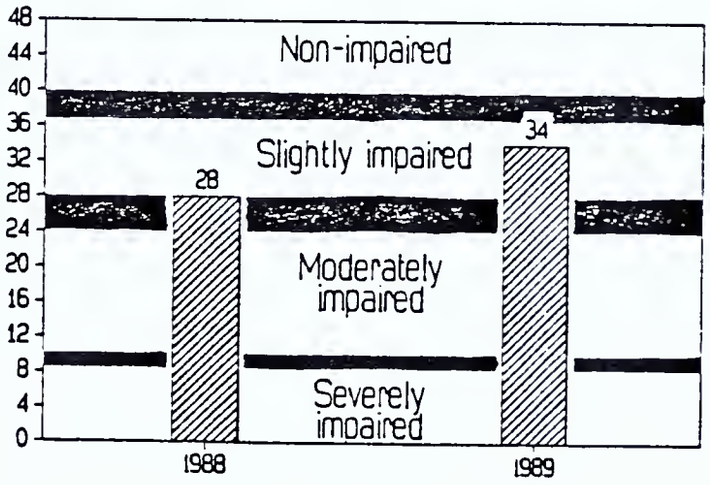


TABLE 37 - HLDN 3.5

WATER QUALITY SUMMARY
HOLDEN CREEK

PARAMETERS EXCEEDING STANDARDS

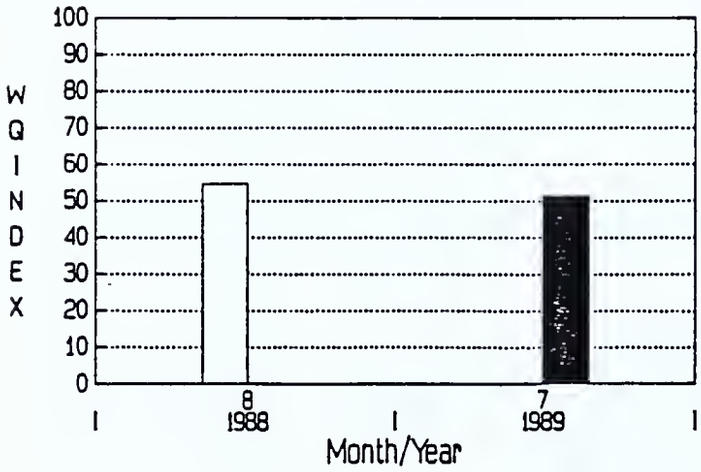
PARAMETER	DATE	VALUE	STANDARD	STATE
TAL	08/01/89	520 ug/l	500 ug/l	Pa. and N.Y. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/01/89	51	DMg TMg

BIOLOGICAL SUMMARY

Number of taxa: 30
Diversity Index: 3.76
RBP Score: 44
RBP Condition: Non-impaired

Water Quality Index



Biological Index

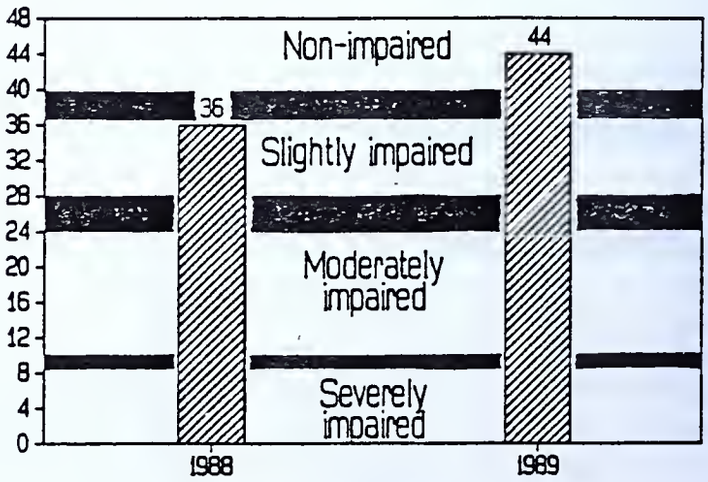


TABLE 38 - TRUP 4.5

WATER QUALITY SUMMARY
TROUPS CREEK

PARAMETERS EXCEEDING STANDARDS

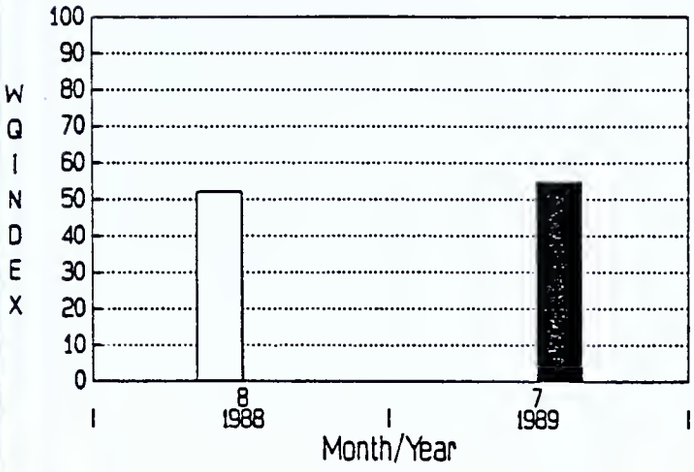
PARAMETER	DATE	VALUE	STANDARD	STATE
TAl	08/01/89	1,700 ug/l	500 ug/l	Pa. and N.Y. chronic fish

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
08/01/89	55	TAl

BIOLOGICAL SUMMARY

Number of taxa: 16
Diversity Index: 2.78
RBP Score: 22
RBP Condition: Moderately impaired

Water Quality Index



Biological Index

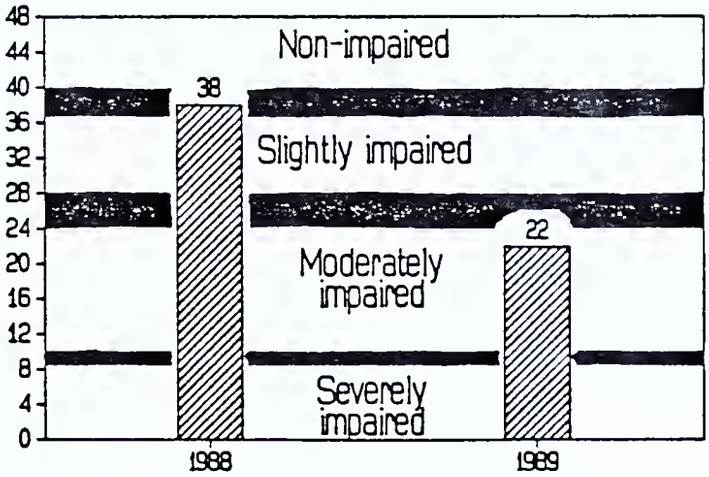


TABLE 39 - NFCR 7.6

WATER QUALITY SUMMARY
NORTH FORK COWANESQUE RIVER

PARAMETERS EXCEEDING STANDARDS

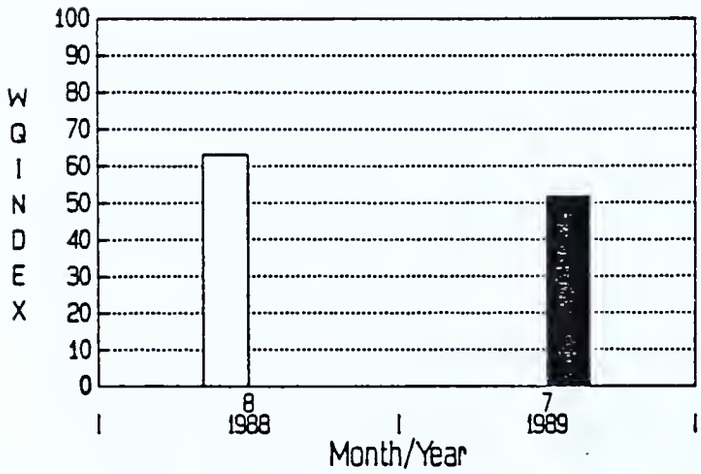
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
07/31/89	52	DP

BIOLOGICAL SUMMARY

Number of taxa: 25
Diversity Index: 3.69
RBP Score: 38
RBP Condition: Slightly impaired

Water Quality Index



Biological Index

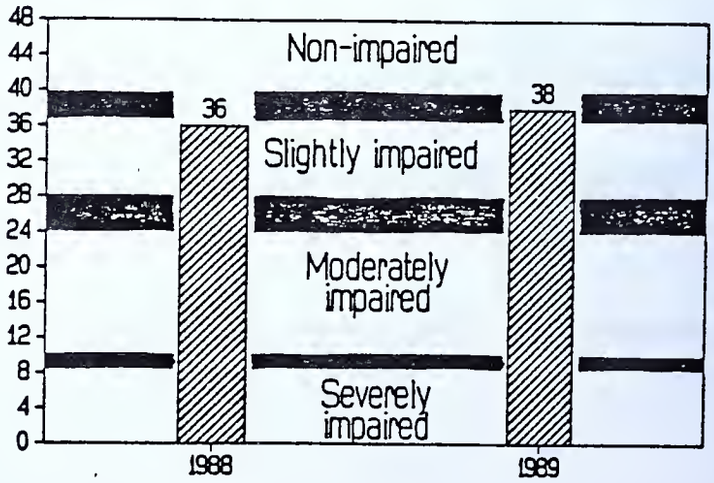


TABLE 40 - WTBR 1.5

WATER QUALITY SUMMARY
WHITE BRANCH

PARAMETERS EXCEEDING STANDARDS

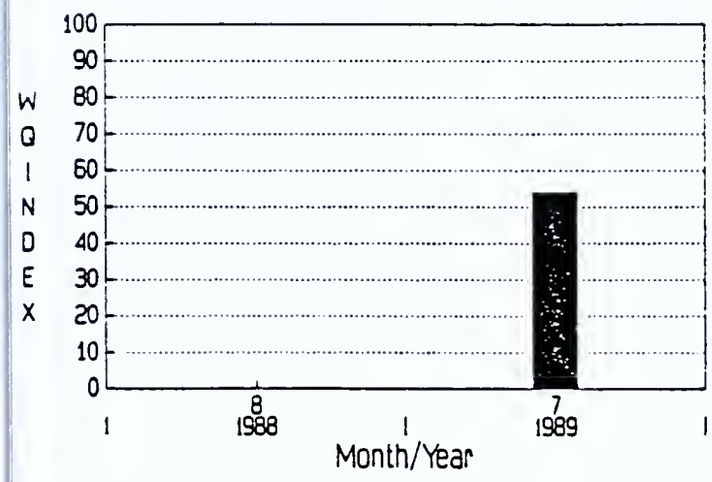
PARAMETER	DATE	VALUE	STANDARD	STATE
none				

DATE	WQINDEX	PARAMETERS EXCEEDING 90th PERCENTILE
07/31/89	51	DNO3

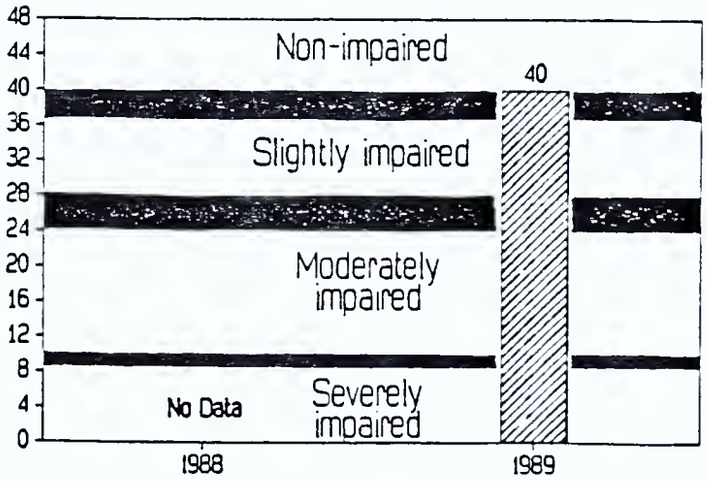
BIOLOGICAL SUMMARY

Number of taxa: 23
Diversity Index: 3.74
RBP Score: 40
RBP Condition: Non-impaired

Water Quality Index



Biological Index



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APPENDIX A

DATA FOR GROUP 1 STATIONS

NOTES AND ABBREVIATIONS

Underlined values exceed water quality standards.

K = actual value is less than reported value.

ND = No data

TABLE A-1 - WATER QUALITY DATA FOR SUSQ 4.8: Susquehanna River at Port Deposit, Maryland

Date >		11/3/88	2/2/89	5/15/89	8/10/89
Time >		7:45	7:40	13:15	10:30
v Parameter v	UNITS				
Discharge	cfs	25,800	36,100	16,300	5,660
Temperature	degrees C	9.0	6.0	13.0	24.0
Conductivity	umhos/cm	390	220	175	270
Dissolved oxygen	mg/l	11.1	11.8	14.8	6.9
Biological oxygen demand	mg/l	1.6	0.8	0.8	1.6
pH	mg/l	7.40	8.00	7.80	7.45
Alkalinity	mg/l	67.0	44.0	20.0	63.0
Acidity	mg/l	12.0	4.0	8.0	13.0
Solids - dissolved	mg/l	228	162	60	240
- total	mg/l	234	178	124	254
Organic carbon - total	mg/l	2.9	2.1	3.4	2.6
Free chlorine	mg/l	0	0	0	ND
Ammonia - dissolved	mg/l	0.19	0.02	0.06	0.08
- total	mg/l	0.20	0.02	0.06	0.10
Nitrite - dissolved	mg/l	0.026	0.010	0.010	0.026
- total	mg/l	0.026	0.010	0.010	0.026
Nitrate - dissolved	mg/l	1.21	2.39	1.1	1.95
- total	mg/l	1.25	2.39	1.1	1.95
Kjeldahl nitrogen - dissolved	mg/l	0.32	0.20 K	0.22	0.23
- total	mg/l	0.47	0.24	0.63	0.29
Orthophosphate - dissolved	mg/l	0.003	0.005	0.003	0.011
- total	mg/l	0.018	0.012	0.033	0.020
Phosphorus - dissolved	mg/l	0.04	0.02	0.05	0.06
- total	ug/l	0.06	0.02	0.12	0.10
Calcium - dissolved	mg/l	37.44	24.25	13.80	28.70
- total	mg/l	39.04	24.25	13.80	29.40
Magnesium - dissolved	mg/l	12.18	7.48	3.71	8.72
- total	ug/l	12.18	7.48	3.89	9.16
Chloride - dissolved	mg/l	25	17	7	13
- total	ug/l	25	18	8	13
Sulfate - dissolved	mg/l	75	21	21	32
- total	mg/l	75	23	22	33
Iron - dissolved	ug/l	100 K	100 K	170	100 K
- total	mg/l	490	310	1890	640
Manganese - dissolved	ug/l	50 K	60	90	50 K
- total	mg/l	180	90	270	170
Aluminum - dissolved	ug/l	150 K	150 K	690	150 K
- total	mg/l	150 K	260	1400	610
Water Quality Index	none	76	53	55	71

TABLE A-2 - WATER QUALITY DATA FOR SUSQ 44.5: Susquehanna River at Columbia, Pennsylvania

Date >		11/3/88	2/1/89	5/15/89	8/10/89
Time >		11:45	11:30	-	14:20
v Parameter v	UNITS				
Discharge	cfs	9,560	18,200	156,000	123,000
Temperature	degrees C	8.0	5.0	ND	23.0
Conductivity	umhos/cm	320	240	ND	310
Dissolved oxygen	mg/l	13.7	13.3	11.2	8.7
Biological oxygen demand	mg/l	2.4	2.7	0.8	3.0
pH	mg/l	8.20	8.50	ND	8.70
Alkalinity	mg/l	66.0	46.0	20.0	69.0
Acidity	mg/l	3.0	0.0	9.0	0.0
Solids - dissolved	mg/l	166	152	74	224
- total	mg/l	184	152	150	242
Organic carbon - total	mg/l	3.7	2.4	3.0	2.9
Free chlorine	mg/l	0	0	ND	0
Ammonia - dissolved	mg/l	0.05	0.02	0.05	0.05
- total	mg/l	0.05	0.02	0.06	0.03
Nitrite - dissolved	mg/l	0.010	0.012	0.010	0.008
- total	mg/l	0.010	0.014	0.010	0.008
Nitrate - dissolved	mg/l	0.67	1.33	1.00	1.20
- total	mg/l	0.73	1.33	1.00	1.20
Kjeldahl nitrogen - dissolved	mg/l	0.30	0.20 K	0.20 K	0.20 K
- total	mg/l	0.52	0.20 K	0.33	0.35
Orthophosphate - dissolved	mg/l	0.002 K	0.002 K	0.003	0.004
- total	mg/l	0.014	0.005	0.022	0.006
Phosphorus - dissolved	mg/l	0.03	0.02	0.05	0.05
- total	ug/l	0.08	0.02	0.12	0.07
Calcium - dissolved	mg/l	32.23	27.03	14.30	32.60
- total	mg/l	34.25	27.03	14.30	32.60
Magnesium - dissolved	mg/l	8.61	7.52	3.45	10.30
- total	ug/l	8.61	7.67	3.92	10.30
Chloride - dissolved	mg/l	22	15	7	15
- total	ug/l	22	15	8	15
Sulfate - dissolved	mg/l	54	46	27	47
- total	mg/l	55	46	32	48
Iron - dissolved	ug/l	100 K	100 K	110	100 K
- total	mg/l	470	430	2260	410
Manganese - dissolved	ug/l	50 K	90	120	50 K
- total	mg/l	130	130	420	70
Aluminum - dissolved	ug/l	150 K	240	720	150 K
- total	mg/l	150 K	310	2190	370
Water Quality Index	none	66	55	53	64

TABLE A-3 - MACROINVERTEBRATE DATA FOR SUSQ 44.5: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Dubiraphia *	
		Optioservus	1
		Stenelmis	6
Diptera	Chironomidae		17
	Empididae	Hemerodromia *	
	Simulidae	Simulium	1
Ephemeroptera	Baetidae	Baetis	10
		Centroptilum *	
		Pseudocloeon	3
	Caenidae	Caenis	1
	Ephemerellidae	Serratella *	
	Heptageniidae	Heptagenia	2
		Leucrocuta *	
		Stenocron	3
		Stenonema	33
	Oligoneuridae	Isonychia	2
	Polymitarcidae	Ephoron	1
	Potamanthidae	Potamanthus	3
	Siphlonuridae	Ameletus *	
	Tricorythidae	Leptohypes	2
		Tricorythodes *	
Lepidoptera	Pyralidae	Petrophila	1
Megaloptera	Corydalidae	Nigronia *	
Odonata	Coenogrionidae	Argia *	
Trichoptera	Hydropsychidae	Cheumatopsyche	4
		Hydropsyche	15
		Macronemum	11
		Symphitopsyche	2
	Hydroptilidae	Leucotrichia *	
		Stactobiella *	
	Philopotamidae	Chimarra	1
	Polycentropoidae	Nyctiophylax *	
Amphipoda	Gammaridae	Gammarus	2
Decapoda	Astacidae	Cambarus	1
Heterodonta	Sphaeridae	Musculium *	
		Psidium	1
Tricladida	Planariidae	Dugesia *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
39	17

RBP Score: 24

Diversity Index: 2.96

TABLE A-4 - DEER 44.2: Deer Creek near Gorsuch Mills, Maryland

Date >		11/2/88	2/1/89	5/18/89	7/24/89
Time >		9:50	9:20	9:20	13:30
v Parameter v	UNITS				
Discharge	cfs	5.92	12.6	54.5	16.9
Temperature	degrees C	7.0	7.5	16.5	24.0
Conductivity	umhos/cm	175	165	153	155
Dissolved oxygen	mg/l	13.0	13.0	10.6	9.3
Biological oxygen demand	mg/l	1.2	0.8	1.2	0.5 K
pH	mg/l	7.10	8.10	7.70	8.40
Alkalinity	mg/l	32.0	26.0	26.0	36.0
Acidity	mg/l	6.0	4.0	6.0	0.0
Solids - dissolved	mg/l	98	116	134	102
- total	mg/l	98	124	154	112
Organic carbon - total	mg/l	1.7	1.2	1.5	1.5
Free chlorine	mg/l	0	0	0	ND
Ammonia - dissolved	mg/l	0.02 K	0.03	0.05	0.02
- total	mg/l	0.02	0.03	0.09	0.06
Nitrite - dissolved	mg/l	0.006	0.008	0.006	0.006
- total	mg/l	0.006	0.010	0.006	0.006
Nitrate - dissolved	mg/l	4.20	4.43	4.60	5.01
- total	mg/l	4.44	4.92	4.60	5.01
Kjeldahl nitrogen - dissolved	mg/l	0.20 K	0.20 K	0.20 K	0.25
- total	mg/l	0.20 K	0.20 K	0.22	0.25
Orthophosphate - dissolved	mg/l	0.004	0.002 K	0.003	0.002 K
- total	mg/l	0.007	0.004	0.012	0.002
Phosphorus - dissolved	mg/l	0.03	0.03	0.05	0.03
- total	ug/l	0.03	0.04	0.05	0.05
Calcium - dissolved	mg/l	13.71	13.33	12.70	14.40
- total	mg/l	14.96	13.73	12.80	15.10
Magnesium - dissolved	mg/l	5.00	5.36	4.54	5.20
- total	ug/l	5.05	5.36	4.61	5.32
Chloride - dissolved	mg/l	18	18	12	15
- total	ug/l	18	18	12	15
Sulfate - dissolved	mg/l	10 K	10 K	10 K	10 K
- total	mg/l	10 K	10 K	10 K	10 K
Iron - dissolved	ug/l	230	100 K	100 K	130
- total	mg/l	230	140	650	400
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	50 K	50
Aluminum - dissolved	ug/l	150 K	190	150 K	150 K
- total	mg/l	150 K	200	680	240
Water Quality Index	none	43	43	48	42

TABLE A-5 - MACROINVERTEBRATE DATA FOR DEER 44.2: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Macronychus *	
		Optioservus	4
		Stenelmis	5
	Gyrinidae	Dineutis *	
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix	4
	Chironomidae		11
	Empididae	Hemerodromia *	
	Simulidae	Simulium	1
	Tipulidae	Antocha	2
		Tipula	1
Ephemeroptera	Baetidae	Baetis	3
		Centroptilum	1
		Neocloeon	5
		Pseudocloeon	2
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella *	
		Eurylophella *	
		Serratella	12
	Heptageniidae	Epeorus	1
		Heptagenia	2
		Ironodes *	
		Stenonema	3
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuridae	Isonychia	8
	Siphlonuridae	Parameletus *	
	Tricorythidae	Tricorythodes *	
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus *	
		Nigronia *	
	Sialidae	Sialis	1
Plecoptera	Perlidae	Acroneuria	1
		Paragnetina *	
		Phasgonophora *	
	Perlodidae	Isoperla *	
	Taeniopterygidae	Strophopteryx	2
Trichoptera	Brachycentridae	Brachycentrus *	
	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	6
		Hydropsyche	5
		Symphitopsyche	31
	Hydroptilidae	Dibusa *	
		Leucotrichia *	
		Stactobiella *	
	Philopotamidae	Chimarra *	
Hydracarina *			
Oligochaeta	Lumbriculidae	Rhynchelmis *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986-1989	1989
47	23

RBP Score: 38

Diversity Index: 3.72

TABLE A-6 - WATER QUALITY DATA FOR EBAU 1.5: Ebaughs Creek near Stewartstown, Pa.

Date >		11/2/88	2/1/89	5/18/89	7/24/89
Time >		10:50	10:00	10:55	14:30
v Parameter v	UNITS				
Discharge	cfs	2.93	4.73	27.7	8.53
Temperature	degrees C	7.0	6.5	15.0	21.0
Conductivity	umhos/cm	148	135	140	170
Dissolved oxygen	mg/l	12.4	13.5	10.6	9.0
Biological oxygen demand	mg/l	0.8	0.8	1.6	0.5 K
pH	mg/l	6.80	8.10	7.90	8.40
Acidity	mg/l	7.0	5.0	6.0	0.0
Alkalinity	mg/l	22.0	18.0	22.0	29.0
Solids - dissolved	mg/l	94	104	110	126
- total	mg/l	94	110	122	136
Organic carbon - total	mg/l	1.3	1.0	1.7	1.5
Free chlorine	mg/l	0	0	0	0
Ammonia - dissolved	mg/l	0.02	0.02	0.07	0.07
- total	mg/l	0.02	0.02	0.13	0.07
Nitrite - dissolved	mg/l	0.004	0.012	0.010	0.014
- total	mg/l	0.004	0.012	0.010	0.014
Nitrate - dissolved	mg/l	5.64	5.99	5.32	6.19
- total	mg/l	5.88	5.99	5.32	6.33
Kjeldahl nitrogen - dissolved	mg/l	0.27	0.20 K	0.22	0.23
- total	mg/l	0.27	0.20 K	0.25	0.25
Orthophosphate - dissolved	mg/l	0.005	0.002	0.003	0.020 K
- total	mg/l	0.012	0.004	0.008	0.020
Phosphorus - dissolved	mg/l	0.03	0.03	0.04	0.04
- total	ug/l	0.04	0.03	0.04	0.06
Calcium - dissolved	mg/l	10.21	10.48	11.20	13.50
- total	mg/l	10.51	10.52	11.20	13.50
Magnesium - dissolved	mg/l	4.62	4.78	4.42	5.30
- total	ug/l	4.62	4.78	4.51	5.34
Chloride - dissolved	mg/l	13	12	10	13
- total	ug/l	13	12	10	13
Sulfate - dissolved	mg/l	10 K	10 K	10 K	10 K
- total	mg/l	10 K	10 K	10 K	10 K
Iron - dissolved	ug/l	120	100 K	100 K	100
- total	mg/l	200	100 K	580	850
Manganese - dissolved	ug/l	50 K	50 K	50 K	100
- total	mg/l	50 K	50 K	50	120
Aluminum - dissolved	ug/l	150 K	270	440	150 K
- total	mg/l	150 K	270	850	420
Water Quality Index	none	40	41	48	53

TABLE A-7 - MACROINVERTEBRATE DATA FOR EBAU 1.5: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	7
		Stenelmis	1
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix *	
	Chironomidae		32
	Empididae	Hemerodromia	2
	Simulidae	Simulium	1
	Tipulidae	Antocha	2
		Tipula *	
Ephemeroptera	Baetidae	Baetis	1
		Centroptilum	6
		Pseudocloeon	1
	Caenidae	Caenis *	
	Ephemerellidae	Drunella *	
		Eurylophella *	
		Serratella	1
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus	1
		Heptagenia *	
		Stenonema	1
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia *	
	Oligoneuridae	Isonychia	1
	Polymitarcidae	Ephoron *	
	Potamanthidae	Potamanthus *	
	Tricorythidae	Leptohypes	2
Megaloptera	Corydalidae	Nigronia	1
Odonata	Aeshnidae	Boyeria *	
	Gomphidae	Gomphus	1
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra *	
	Perlidae	Acroneuria *	
		Phasgonophora *	
Trichoptera	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche	21
		Symphitopsyche	34
	Hydroptilidae	Dibusa *	
		Leucotrichia *	
		Neotrichia *	
	Philopotamidae	Chimarra	1
	Polycentropoidae	Nyctiophylax *	
Decapoda	Astacidae	Cambarus *	
Tricladida	Planariidae	Dugesia *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986-1989	1989
44	20

RBP Score: 30

Diversity Index: 2.90

TABLE A-8 - WATER QUALITY DATA FOR SCTT 3.0: Scott Creek at Delta, Pa.

Date >		11/2/88	2/1/89	5/18/89	7/25/89
Time >		12:50	11:10	12:25	13:25
v Parameter v	UNITS				
Discharge	cfs	0.135	0.456	2.29	0.763
Temperature	degrees C	9.0	8.0	17.0	21.0
Conductivity	umhos/cm	430	340	225	238
Dissolved oxygen	mg/l	4.8	13.0	9.5	7.9
Biological oxygen demand	mg/l	7.2	2.8	2.0	0.4 K
pH	mg/l	7.00	8.00	7.70	7.40
Alkalinity	mg/l	108.0	48.0	37.0	48.0
Acidity	mg/l	34.0	7.0	10.0	8.0
Solids - dissolved	mg/l	192	256	150	154
- total	mg/l	204	294	174	154
Organic carbon - total	mg/l	9.4	2.7	2.7	2.4
Free chlorine	mg/l	0	0	0	0
Ammonia - dissolved	mg/l	0.20	0.30	0.09	0.19
- total	mg/l	0.21	0.30	0.09	0.21
Nitrite - dissolved	mg/l	0.026	0.036	0.020	0.050
- total	mg/l	0.026	0.038	0.022	0.050
Nitrate - dissolved	mg/l	1.01	3.32	1.87	1.93
- total	mg/l	1.03	3.32	1.87	1.93
Kjeldahl nitrogen - dissolved	mg/l	0.80	0.48	0.22	0.28
- total	mg/l	1.13	0.75	0.24	0.30
Orthophosphate - dissolved	mg/l	0.029	0.016	0.043	0.005
- total	mg/l	0.330	0.033	0.053	0.040
Phosphorus - dissolved	mg/l	0.12	0.05	0.07	0.06
- total	ug/l	0.51	0.11	0.10	0.10
Calcium - dissolved	mg/l	25.00	23.46	13.60	16.60
- total	mg/l	27.33	23.46	13.60	16.70
Magnesium - dissolved	mg/l	13.30	13.70	8.07	8.97
- total	ug/l	13.55	13.77	8.20	9.11
Chloride - dissolved	mg/l	47	46	25	30
- total	ug/l	47	46	25	31
Sulfate - dissolved	mg/l	18	15	22	22
- total	mg/l	21	37	23	26
Iron - dissolved	ug/l	1790	110	180	100 K
- total	mg/l	4120	1220	520	240
Manganese - dissolved	ug/l	1520	270	90	110
- total	mg/l	1550	380	110	190
Aluminum - dissolved	ug/l	150 K	150 K	150 K	150 K
- total	mg/l	150 K	640	260	200
Water Quality Index	none	86	80	67	68

TABLE A-9 - MACROINVERTEBRATE DATA FOR SCTT 3.0: 1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Diptera	Chironomidae	.....	44
	Empididae	Hemerodromia.....	1
	Simulidae	Simulium.....	27
	Tabanidae	Chrysops.....	1
	Tipulidae	Antocha.....	1
		Pedicia.....	1
		Tipula.....	1
Ephemeroptera	Baetidae	Baetis.....	1
Trichoptera	Glossomatidae	Glossosoma.....	4
	Hydropsychidae	Hydropsyche.....	18
		Symphitopsyche.....	1
Isopoda	Asellidae	Asellus.....	1
Oligochaeta	Naididae	Nais.....	5

NUMBER OF TAXA

1989
13

RBP Score: 12

Diversity Index: 2.34

TABLE A-10 - WATER QUALITY DATA FOR CNWG 4.4: Conowingo Creek at Pleasant Grove, Pa.

Date >		11/3/88	2/1/89	5/18/89	7/26/89
Time >		9:25	14:40	14:40	12:10
v Parameter v	UNITS				
Discharge	cfs	9.56	21.4	51.7	51.7
Temperature	degrees C	7.0	9.0	22.0	26.0
Conductivity	umhos/cm	192	200	210	225
Dissolved oxygen	mg/l	12.1	13.1	10.4	9.7
Biological oxygen demand	mg/l	1.2	0.8	2.4	1.2
pH	mg/l	6.90	8.30	8.00	7.70
Alkalinity	mg/l	28.0	28.0	37.0	44.0
Acidity	mg/l	12.0	0.0	6.0	4.0
Solids - dissolved	mg/l	88	146	192	158
- total	mg/l	90	156	214	176
Organic carbon - total	mg/l	2.7	2.1	3.9	2.4
Free chlorine	mg/l	0	0	0	ND
Ammonia - dissolved	mg/l	0.05	0.02	0.04	0.03
- total	mg/l	0.05	0.02	0.04	0.03
Nitrite - dissolved	mg/l	0.020	0.024	0.032	0.026
- total	mg/l	0.020	0.026	0.034	0.026
Nitrate - dissolved	mg/l	7.00	7.54	7.02	7.92
- total	mg/l	7.02	7.54	7.26	8.15
Kjeldahl nitrogen - dissolved	mg/l	0.37	0.22	0.34	0.31
- total	mg/l	0.47	0.22	0.44	0.39
Orthophosphate - dissolved	mg/l	0.008	0.012	0.056	0.007
- total	mg/l	0.024	0.026	0.077	0.020
Phosphorus - dissolved	mg/l	0.05	0.03	0.10	0.05
- total	ug/l	0.06	0.03	0.16	0.09
Calcium - dissolved	mg/l	14.18	14.27	15.20	16.30
- total	mg/l	14.18	14.27	15.20	16.30
Magnesium - dissolved	mg/l	7.48	8.47	8.82	8.96
- total	ug/l	7.49	8.47	9.07	9.09
Chloride - dissolved	mg/l	15	18	13	14
- total	ug/l	15	18	13	14
Sulfate - dissolved	mg/l	10	18	14	10 K
- total	mg/l	12	21	16	15
Iron - dissolved	ug/l	120	100 K	100 K	120
- total	mg/l	200	230	1190	820
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	50	50 K
Aluminum - dissolved	ug/l	150 K	200	150 K	190
- total	mg/l	150 K	340	990	650
Water Quality Index	none	57	55	68	60

TABLE A-11 - MACROINVERTEBRATE DATA FOR CNWG 4.4: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Macronychus *	
		Ordobrevia *	
		Optioservus	1
		Stenelmis	9
	Hydrophilidae	Berosus *	
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix	1
	Chironomidae		12
	Empididae	Hemerodromia *	
	Simulidae	Simulium	6
	Tipulidae	Antocha *	
Ephemeroptera	Baetidae	Baetis	6
	Caenidae	Caenis *	
	Ephemerellidae	Serratella *	
	Heptageniidae	Heptagenia	1
		Stenocron	1
		Stenonema	3
	Leptophlebiidae	Paraleptophlebia	1
	Oligoneuridae	Isonychia *	
	Siphlonuridae	Ameletus *	
Megaloptera	Corydalidae	Corydalus	3
		Chauliodes *	
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Coenogrionidae	Argia *	
Plecoptera	Leuctridae	Leuctra *	
Trichoptera	Brachycentridae	Micrasema *	
	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche	8
		Symphitopsyche	10
	Hydroptilidae	Leucotrichia *	
	Philopotamidae	Chimarra	2
Decapoda	Astacidae	Cambarus	1
		Orconectes *	
Isopoda	Asellidae	Asellus	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
35	18

RBP Score: 32

Diversity Index: 3.65

TABLE A-12 - WATER QUALITY DATA FOR OCTO 6.6: Octoraro Creek at New Bridge, Md.

Date >		11/2/88	2/1/89	5/18/89	7/26/89
Time >		15:10	13:45	14:15	13:15
v Parameter v	UNITS				
Discharge	cfs	43.1	51.7	267	265
Temperature	degrees C	9.0	11.0	20.5	26.0
Conductivity	umhos/cm	205	195	220	185
Dissolved oxygen	mg/l	13.4	13.9	10.8	8.9
Biological oxygen demand	mg/l	0.08	0.80	4.0	2.4
pH	mg/l	8.20	8.60	8.40	7.40
Alkalinity	mg/l	42.0	37.0	33.0	36.0
Acidity	mg/l	1.0	0.0	0.0	6.0
Solids - dissolved	mg/l	138	158	152	122
- total	mg/l	138	176	192	180
Organic carbon - total	mg/l	3.4	2.8	4.7	5.2
Free chlorine	mg/l	0	0	0	0
Ammonia - dissolved	mg/l	0.03	0.02	0.05	0.07
- total	mg/l	0.03	0.02	0.05	0.07
Nitrite - dissolved	mg/l	0.012	0.018	0.038	0.009
- total	mg/l	0.014	0.020	0.040	0.009
Nitrate - dissolved	mg/l	4.61	5.86	5.57	4.88
- total	mg/l	4.61	5.86	5.57	5.01
Kjeldahl nitrogen - dissolved	mg/l	0.35	0.20 K	0.42	0.45
- total	mg/l	0.37	0.38	0.76	0.80
Orthophosphate - dissolved	mg/l	0.008	0.017	0.016	0.006
- total	mg/l	0.019	0.022	0.028	0.070
Phosphorus - dissolved	mg/l	0.04	0.04	0.06	0.09
- total	ug/l	0.04	0.05	0.16	0.25
Calcium - dissolved	mg/l	15.36	15.78	14.80	14.90
- total	mg/l	16.03	16.05	15.70	15.00
Magnesium - dissolved	mg/l	7.75	9.19	7.64	7.20
- total	ug/l	7.77	9.26	8.34	7.66
Chloride - dissolved	mg/l	15	14	11	10
- total	ug/l	15	14	11	10
Sulfate - dissolved	mg/l	16	10 K	21	16
- total	mg/l	18	10 K	22	18
Iron - dissolved	ug/l	100 K	100 K	100 K	150
- total	mg/l	150	200	1410	3320
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	110	140
Aluminum - dissolved	ug/l	150 K	220	160	390
- total	mg/l	150 K	270	1490	2960
Water Quality Index	none	52	56	66	68

TABLE A-13 - MACROINVERTEBRATE DATA FOR OCTO 6.6: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	1
		Stenelmis *	
	Psephenidae	Psephenus	1
Diptera	Chironomidae		75
	Empididae	Hemerodromia *	
	Simulidae	Simulium	7
	Tipulidae	Antocha	5
Ephemeroptera	Baetidae	Baetis	6
		Neocloeon *	
		Pseudocloeon	2
	Ephemerellidae	Ephemerella	1
		Serratella *	
	Heptageniidae	Heptagenia *	
		Stenonema	2
	Oligoneuridae	Isonychia *	
	Siphlonuridae	Siphlonurus *	
	Tricorythidae	Leptohypes *	
		Tricorythodes	1
Megaloptera	Corydalidae	Corydalus *	
Odonata	Coenogrionidae	Argia *	
Plecoptera	Perlidae	Acroneuria *	
Trichoptera	Brachycentridae	Brachycentrus	1
		Micrasema *	
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	5
		Macronemum *	
		Symphitopsyche	8
	Hydroptilidae	Leucotrichia	2
		Stactobiella *	
	Philopotamidae	Chimarra	1
Amphipoda	Gammaridae	Gammarus	1
Cladocera	Leptodoridae	Leptodora *	
Heterodonta	Corbiculidae	Corbicula	1
	Sphaeridae	Psidium	1
Oligochaeta	Naididae *		
Tricladida	Planariidae	Dugesia	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
36	20

RBP Score: 20

Diversity Index: 2.55

TABLE A-14 - WATER QUALITY DATA FOR SUSQ 365.0: Susquehanna River at Windsor, N.Y.

Date >		10/31/89	1/30/89	5/17/89	8/9/89
Time >		12:45	12:45	8:00	12:30
v Parameter v	UNITS				
Discharge	cfs	1,830	1,740	6,270	733
Temperature	degrees C	6.0	4.5	12.5	22.0
Conductivity	umhos/cm	185	195	140	220
Dissolved oxygen	mg/l	12.2	13.8	10.8	8.8
Biological oxygen demand	mg/l	1.6	1.2	0.8	1.6
pH	mg/l	7.85	7.90	6.90	ND
Alkalinity	mg/l	46.0	60.0	44.0	ND
Acidity	mg/l	5.0	3.0	7.0	ND
Solids - dissolved	mg/l	104	130	102	140
- total	mg/l	116	136	138	148
Organic carbon - total	mg/l	3.1	2.8	2.8	2.8
Free chlorine	mg/l	0	0	0	0
Ammonia - dissolved	mg/l	0.02 K	0.05	0.05	0.04
- total	mg/l	0.02	0.05	0.05	0.05
Nitrite - dissolved	mg/l	0.004	0.010	0.004	0.006
- total	mg/l	0.004	0.010	0.004	0.006
Nitrate - dissolved	mg/l	0.58	1.09	0.74	0.61
- total	mg/l	0.58	1.09	0.74	0.61
Kjeldahl nitrogen - dissolved	mg/l	0.31	0.20 K	0.30	0.20 K
- total	mg/l	0.31	0.20 K	0.30	0.20 K
Orthophosphate - dissolved	mg/l	0.002	0.004	0.002	0.007
- total	mg/l	0.013	0.008	0.008	0.009
Phosphorus - dissolved	mg/l	0.03	0.04	0.04	0.05
- total	ug/l	0.04	0.05	0.07	0.07
Calcium - dissolved	mg/l	25.01	27.23	18.40	28.90
- total	mg/l	25.10	28.07	19.20	30.50
Magnesium - dissolved	mg/l	1.79	3.21	2.24	3.91
- total	ug/l	2.88	3.28	2.30	3.94
Chloride - dissolved	mg/l	9	16	7	12
- total	ug/l	10	16	7	12
Sulfate - dissolved	mg/l	16	10 K	ND	10 K
- total	mg/l	16	15	13	10 K
Iron - dissolved	ug/l	100 K	100 K	100 K	100 K
- total	mg/l	140	230	180	230
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	50 K	50 K
Aluminum - dissolved	ug/l	150 K	150 K	150 K	150 K
- total	mg/l	150 K	150	370	160
Water Quality Index	none	40	49	40	47

TABLE A-15 - MACROINVERTEBRATE DATA FOR SUSQ 365.0: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Gonielmis *	
		Macronychus *	
		Optioservus	2
		Stenelmis	3
	Gyrinidae	Dineutis	1
	Psephenidae	Psephenus	5
Diptera	Athericidae	Atherix *	
	Chironomidae		17
	Simulidae	Simulium	1
	Tipulidae	Antocha	1
Ephemeroptera	Baetidae	Baetis	12
		Centroptilum *	
		Pseudocloeon	15
	Caenidae	Caenis *	
	Ephemerellidae	Serratella	1
	Heptageniidae	Heptagenia	5
		Rhithrogena *	
		Stenocron *	
		Stenonema	12
	Oligoneuridae	Isonychia	7
	Polymitarcidae	Ephoron	2
	Potamanthidae	Potamanthus	1
Megaloptera	Corydalidae	Corydalus *	
	Sialidae	Sialis *	
Plecoptera	Perlidae	Acroneuria *	
		Neoperla	1
		Paragnetina	1
		Phasgonophora	1
	Perlodidae	Isoperla *	
Trichoptera	Hydropsychidae	Cheumatopsyche	4
		Hydropsyche	7
		Macronemum	7
		Symphitopsyche	9
	Hydroptilidae	Stactobiella	1
	Lepidostomatidae	Theliopsyche *	
	Leptoceridae	Mystacides *	
	Limnephilidae	Frenesia *	
	Philopotamidae	Chimarra	31
	Polycentropoidae	Neureclipsis *	
		Nyctiophylax *	
Amphipoda	Gammaridae	Gammarus *	
Decapoda	Astacidae	Cambarus	1
Pulmonata	Physidae	Physa	1
Tricladida	Planariidae	Dugesia *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
44	26

RBP Score: 42

Diversity Index: 3.90

TABLE A-16 - WATER QUALITY DATA FOR SUSQ 340.0: Susquehanna River at Kirkwood, N.Y.

Date >		10/31/88	1/30/89	5/17/89	8/9/89
Time >		11:45	11:50	8:50	10:00
v Parameter v	UNITS				
Discharge	cfs	1,850	1,800	8,220	970
Temperature	degrees C	6.0	4.0	13.5	21.0
Conductivity	umhos/cm	185	170	148	173
Dissolved oxygen	mg/l	12.0	14.0	10.9	8.2
Biological oxygen demand	mg/l	1.6	1.2	1.2	1.2
pH	mg/l	7.75	7.10	7.80	ND
Alkalinity	mg/l	42.0	54.0	35.0	ND
Acidity	mg/l	5.0	4.0	9.0	ND
Solids - dissolved	mg/l	104	140	72	94
- total	mg/l	122	150	108	110
Organic carbon - total	mg/l	3.3	2.7	2.9	3.5
Free chlorine	mg/l	2	0	ND	0
Ammonia - dissolved	mg/l	0.02 K	0.04	0.08	0.05
- total	mg/l	0.02	0.04	0.08	0.05
Nitrite - dissolved	mg/l	0.008	0.008	0.004	0.004
- total	mg/l	0.008	0.010	0.004	0.004
Nitrate - dissolved	mg/l	0.52	0.96	0.66	0.55
- total	mg/l	0.52	0.98	0.66	0.55
Kjeldahl nitrogen - dissolved	mg/l	0.31	0.20 K	0.30	0.20 K
- total	mg/l	0.31	0.20 K	0.30	0.21
Orthophosphate - dissolved	mg/l	0.004	0.010	0.003	0.007
- total	mg/l	0.014	0.024	0.012	0.014
Phosphorus - dissolved	mg/l	0.04	0.03	0.04	0.06
- total	ug/l	0.06	0.04	0.07	0.06
Calcium - dissolved	mg/l	25.19	25.07	15.90	22.60
- total	mg/l	25.19	25.81	14.90	22.60
Magnesium - dissolved	mg/l	2.97	3.09	2.13	3.22
- total	ug/l	2.97	3.18	2.13	3.30
Chloride - dissolved	mg/l	10	17	6	12
- total	ug/l	10	18	6	12
Sulfate - dissolved	mg/l	18	10	12	10 K
- total	mg/l	18	11	16	10 K
Iron - dissolved	ug/l	100 K	100 K	100 K	100 K
- total	mg/l	170	180	690	520
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	50	50
Aluminum - dissolved	ug/l	150 K	150 K	150 K	150 K
- total	mg/l	150 K	150	390	230
Water Quality Index	none	44	49	42	43

TABLE A-17 - MACROINVERTEBRATE DATA FOR SUSQ 340.0: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Ancyronx *	
		Dubiraphia *	
		Macronychus *	
		Optioservus	1
		Stenelmis	4
	Hydrophilidae	Berosus *	
	Psephenidae	Psephenus	1
	Ptilodactylidae	Anchytarsus *	
Diptera	Athericidae	Atherix	1
	Chironomidae		47
	Tipulidae	Antocha	1
		Tipula *	
Ephemeroptera	Baetidae	Baetis	18
		Centroptilum	1
		Pseudocloeon	6
	Caenidae	Brachycercus	2
		Caenis	3
	Ephemerellidae	Serratella *	
	Heptageniidae	Heptagenia	1
		Stenocron	1
		Stenonema	8
	Leptophlebiidae	Paraleptophlebia	2
	Oligoneuridae	Isonychia *	
	Polymitarcidae	Ephoron	1
	Potamanthidae	Potamanthus	4
	Tricorythidae	Tricorythodes	1
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus	1
Odonata	Coenogrionidae	Argia	2
Plecoptera	Perlidae	Neoperla	1
		Phasgonophora *	
Trichoptera	Brachycentridae	Brachycentrus	1
	Helicopsychidae	Helicopsyche *	
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	1
		Macronemum	5
		Symphitopsyche	5
	Hydroptilidae	Stactobiella	1
	Lepidostomatidae	Lepidostoma *	
		Theliopsyche *	
	Philopotamidae	Chimarra *	
Hydracarina *			
Amphipoda	Gammaridae	Gammarus	1
Decapoda	Astacidae	Cambarus	1
Heterodonta	Sphaeridae	Musculium *	
		Psidium	1
Oligochaeta	Naididae *		
Tricladida	Planariidae	Dugesia *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
48	30

RBP Score: 36

Diversity Index: 3.50

TABLE A-18 - WATER QUALITY DATA FOR SUSQ 289.1: Susquehanna River at Sayre, Pa.

Date >		10/31/88	1/30/89	5/16/89	8/7/89
Time >		14:30	14:30	14:10	14:00
v Parameter v	UNITS				
Discharge	cfs	3,820	4,060	26,100	2,680
Temperature	degrees C	6.0	5.0	13.0	24.0
Conductivity	umhos/cm	210	220	120	290
Dissolved oxygen	mg/l	12.2	13.8	11.9	7.3
Biological oxygen demand	mg/l	1.6	1.6	1.2	1.2
pH	mg/l	7.90	8.80	7.90	7.90
Alkalinity	mg/l	56.0	70.0	30.0	ND
Acidity	mg/l	4.0	0.0	12.0	ND
Solids - dissolved	mg/l	120	170	108	244
- total	mg/l	134	180	168	262
Organic carbon - total	mg/l	3.9	2.7	3.5	2.8
Free chlorine	mg/l	0	0	0	ND
Ammonia - dissolved	mg/l	0.08	0.10	0.07	0.05
- total	mg/l	0.09	0.10	0.07	0.08
Nitrite - dissolved	mg/l	0.012	0.012	0.004	0.010
- total	mg/l	0.012	0.012	0.004	0.010
Nitrate - dissolved	mg/l	0.73	1.15	0.73	0.89
- total	mg/l	0.73	1.15	0.73	0.89
Kjeldahl nitrogen - dissolved	mg/l	0.41	0.20 K	0.30	0.20 K
- total	mg/l	0.54	0.20 K	0.30	0.24
Orthophosphate - dissolved	mg/l	0.003	0.004	0.003	0.042
- total	mg/l	0.022	0.014	0.016	0.050
Phosphorus - dissolved	mg/l	0.04	0.03	0.05	0.10
- total	ug/l	0.06	0.03	0.09	0.11
Calcium - dissolved	mg/l	27.74	30.27	15.20	34.70
- total	mg/l	27.74	30.27	16.10	34.70
Magnesium - dissolved	mg/l	3.97	4.63	2.65	5.80
- total	ug/l	4.03	4.63	2.93	6.16
Chloride - dissolved	mg/l	14	21	8	22
- total	ug/l	15	21	8	22
Sulfate - dissolved	mg/l	19	19	15	10 K
- total	mg/l	19	19	15	10 K
Iron - dissolved	ug/l	100 K	100 K	100 K	100 K
- total	mg/l	200	180	1400	420
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	50	50 K
Aluminum - dissolved	ug/l	150 K	180	150 K	210
- total	mg/l	150 K	150 K	1000	290
Water Quality Index	none	56	56	48	63

TABLE A-19 - MACROINVERTEBRATE DATA FOR SUSQ 289.1: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	2
		Stenelmis	7
	Psephenidae	Psephenus	3
Diptera	Athericidae	Atherix *	
	Chironomidae		2
	Empididae	Hemerodromia *	
	Simulidae	Simulium *	
Ephemeroptera	Baetidae	Baetis	20
		Pseudocloeon	1
	Caenidae	Caenis	4
	Ephemerellidae	Ephemerella	1
		Serratella *	
	Heptageniidae	Heptagenia	28
		Rhithrogena *	
		Stenocron	1
		Stenonema	3
	Leptophlebiidae	Leptophlebia	1
	Oligoneuridae	Isonychia	1
	Polymitarcidae	Ephoron	3
	Potamanthidae	Potamanthus	1
	Tricorythidae	Tricorythodes *	
Lepidoptera	Pyralidae	Petrophila *	
Odonata	Coenogrionidae	Argia *	
Plecoptera	Leuctridae	Leuctra *	
	Perlidae	Phasgonophora *	
Trichoptera	Hydropsychidae	Cheumatopsyche	11
		Hydropsyche	1
		Macronemum	10
		Symphitopsyche	1
	Hydroptilidae	Ochrotrichia *	
	Philopotamidae	Chimarra	8
Amphipoda	Gammaridae	Gammarus	1
Annelida	Hirudinea		1
Decapoda	Astacidae	Cambarus	1
		Orconectes *	
Heterodonta	Sphaeridae	Psidium	1
Pulmonata	Physidae	Physa *	

* - Taxa not collected during 1989

NUMBER OF TAXA

1986 - 1989	1989
37	24

RBP Score: 44

Diversity Index: 3.61

TABLE A-20 - WATER QUALITY DATA FOR CHEM 12.0: Chemung River at Chemung, New York

Date >		11/1/88	1/31/89	5/16/89	8/7/89
Time >		9:40	9:05	13:05	10:55
v Parameter v	UNITS				
Discharge	cfs	331	538	19,000	640
Temperature	degrees C	4.5	6.0	13.5	23.5
Conductivity	umhos/cm	460	370	143	420
Dissolved oxygen	mg/l	13.0	12.0	13.0	7.3
Biological oxygen demand	mg/l	1.2	2.4	2.0	1.6
pH	mg/l	ND	8.40	7.80	8.10
Alkalinity	mg/l	ND	95.0	32.0	114.0
Acidity	mg/l	ND	0.0	9.0	5.0
Solids - dissolved	mg/l	292	276	150	272
- total	mg/l	296	288	364	288
Organic carbon - total	mg/l	2.6	3.8	5.7	3.2
Free chlorine	mg/l	0	0	0	0
Ammonia - dissolved	mg/l	0.02 K	0.07	0.07	0.06
- total	mg/l	0.02	0.10	0.07	0.08
Nitrite - dissolved	mg/l	0.014	0.020	0.004	0.010
- total	mg/l	0.014	0.020	0.012	0.010
Nitrate - dissolved	mg/l	0.85	1.04	0.63	1.05
- total	mg/l	0.85	1.04	0.63	1.05
Kjeldahl nitrogen - dissolved	mg/l	0.33	0.20 K	0.22	0.32
- total	mg/l	0.33	0.20 K	0.53	0.75
Orthophosphate - dissolved	mg/l	0.057	0.039	0.008	0.042
- total	mg/l	0.066	0.067	0.077	0.052
Phosphorus - dissolved	mg/l	0.10	0.07	0.05	0.09
- total	ug/l	0.10	0.09	0.20	0.09
Calcium - dissolved	mg/l	53.57	42.77	14.00	44.20
- total	mg/l	53.57	44.91	16.00	45.90
Magnesium - dissolved	mg/l	12.13	9.62	3.19	1.00
- total	ug/l	12.13	10.05	3.53	11.20
Chloride - dissolved	mg/l	44	44	9	36
- total	ug/l	44	44	9	36
Sulfate - dissolved	mg/l	45	39	21	43
- total	mg/l	45	40	23	52
Iron - dissolved	ug/l	120	100 K	130	100 K
- total	mg/l	120	380	1900	230
Manganese - dissolved	ug/l	50 K	90	50 K	50 K
- total	mg/l	50 K	120	200	70
Aluminum - dissolved	ug/l	150 K	150 K	150 K	150 K
- total	mg/l	150 K	400	870	190
Water Quality Index	none	70	75	59	72

TABLE A-21 - MACROINVERTEBRATE DATA FOR CHEM 12.0: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Dubiraphia	4
		Optioservus	1
		Stenelmis	2
	Hydrophilidae	Berosus	7
	Psephenidae	Ectopria *	
		Psephenus	1
	Ptilodactylidae	Anchytarsus *	
Diptera	Chironomidae		53
	Empididae	Hemerodromia *	
	Simulidae	Simulium *	
Ephemeroptera	Baetidae	Baetis	1
		Pseudocloeon *	
	Caenidae	Caenis	17
	Ephemerellidae	Serratella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Heptagenia	1
		Stenocron	7
		Stenonema	5
	Leptophlebiidae	Paraleptophlebia	1
	Oligoneuridae	Isonychia	1
	Polymitarcidae	Ephoron	3
	Potamanthidae	Potamanthus	1
	Siphlonuridae	Parameletus *	
	Tricorythidae	Tricorythodes	3
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Sialidae	Sialis	1
Odonata	Coenogrionidae	Argia	1
	Gomphidae	Gomphus	1
		Ophiogomphus	1
Plecoptera	Perlidae	Acroneuria *	
		Neoperla	1
	Perlodidae	Isoperla *	
Trichoptera	Helicopsychidae	Helicopsyche *	
	Hydropsychidae	Cheumatopsyche	1
		Hydropsyche *	
		Symphitopsyche	1
	Hydroptilidae	Dibusa	1
	Polycentropoidae	Neureclipsis *	
		Nyctiophylax *	
Amphipoda	Talitridae	Hyalella	1
Decapoda	Astacidae	Cambarus	1
		Orconectes *	
Heterodonta	Sphaeridae	Musculium *	
Pulmonata	Physidae	Physa *	
Oligochaeta	Glossiphoniidae	Batrachobdella	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
46	27

RBP Score: 28

Diversity Index: 3.00

TABLE A-22 - WATER QUALITY DATA FOR TIOG 10.8: Tioga River at Lindley, N.Y.

Date >		11/1/88	1/31/89	5/16/89	8/1/89
Time >		11:05	10:20	11:15	14:30
v Parameter v	UNITS				
Discharge	cfs	100	171	8,180	151
Temperature	degrees C	5.0	5.5	12.0	20.0
Conductivity	umhos/cm	357	275	145	232
Dissolved oxygen	mg/l	12.4	12.5	13.0	8.6
Biological oxygen demand	mg/l	1.2	0.8	1.2	0.8
pH	mg/l	ND	7.80	6.60	ND
Alkalinity	mg/l	ND	38.0	22.0	ND
Acidity	mg/l	ND	6.0	9.0	ND
Solids - dissolved	mg/l	204	222	100	162
- total	mg/l	220	230	138	164
Organic carbon - total	mg/l	2.5	2.1	4.5	3.1
Free chlorine	mg/l	0	0	0	ND
Ammonia - dissolved	mg/l	0.03	0.13	0.05	0.05
- total	mg/l	0.06	0.13	0.06	0.05
Nitrite - dissolved	mg/l	0.004	0.008	0.004	0.012
- total	mg/l	0.004	0.008	0.008	0.014
Nitrate - dissolved	mg/l	0.38	0.52	0.74	0.74
- total	mg/l	0.44	0.52	0.74	0.96
Kjeldahl nitrogen - dissolved	mg/l	0.20	0.20 K	0.20 K	0.20 K
- total	mg/l	0.20	0.20 K	0.25	0.20 K
Orthophosphate - dissolved	mg/l	0.002	0.005	0.005	0.002
- total	mg/l	0.004	0.008	0.034	0.006
Phosphorus - dissolved	mg/l	0.03	0.03	0.05	0.03
- total	ug/l	0.03	0.04	0.08	0.05
Calcium - dissolved	mg/l	32.16	30.49	12.70	23.90
- total	mg/l	33.22	30.49	13.00	24.20
Magnesium - dissolved	mg/l	10.13	6.87	2.97	7.02
- total	ug/l	10.46	8.68	3.21	7.02
Chloride - dissolved	mg/l	15	20	5	10
- total	ug/l	16	20	5	10
Sulfate - dissolved	mg/l	86	72	25	54
- total	mg/l	87	74	27	55
Iron - dissolved	ug/l	100 K	100 K	110	100
- total	mg/l	100 K	100	1430	300
Manganese - dissolved	ug/l	800	1120	180	120
- total	mg/l	830	1170	300	150
Aluminum - dissolved	ug/l	150 K	150 K	150 K	210
- total	mg/l	150 K	180	1160	400
Water Quality Index	none	57634955			

TABLE A-23 - MACROINVERTEBRATE DATA FOR TIOG 10.8: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Stenelmis	1
	Gyrinidae	Dineutis *	
	Hydrophilidae	Berosus	3
	Psephenidae	Psephenus *	
Diptera	Chironomidae		23
Empididae	Hemerodromia *		
	Simulidae	Simulium *	
	Tipulidae	Antocha	7
		Tipula *	
Ephemeroptera	Baetidae	Baetis *	
		Heterocloeon *	
		Pseudocloeon	3
	Heptageniidae	Stenocron *	
		Stenonema	5
	Oligoneuridae	Isonychia *	
	Siphlonuridae	Ameletus *	
	Tricorythidae	Tricorythodes	1
Megaloptera	Corydalidae	Corydalus	2
		Nigronia *	
Neuroptera	Sisyridae	Climacia *	
Odonata	Coenogrionidae	Argia *	
	Gomphidae	Gomphus	1
		Ophiogomphus	1
Plecoptera	Perlidae	Acroneuria *	
		Perlesta *	
	Perlodidae	Isoperla *	
Trichoptera	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	15
		Hydropsyche	5
		Symphitopsyche	19
	Hydroptilidae	Agraylea *	
		Dibusa *	
		Hydroptila *	
	Philopotamidae	Chimarra	1
	Polycentropoidae	Neureclipsis	22
		Nyctiophylax *	
Amphipoda	Gammaridae	Gammarus	1
Heterodonta	Sphaeridae	Psidium	1
Oligochaeta	Naididae *		

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
39	24

RBP Score: 24

Diversity Index: 2.96

TABLE A-24 - WATER QUALITY DATA FOR CAYT 1.7: Cayuta Creek at Waverly, New York

Date >		11/1/88	1/31/89	5/16/89	8/7/89
Time >		8:25	8:00	13:45	12:50
v Parameter v	UNITS				
Discharge	cfs	28.7	423	ND	23.9
Temperature	degrees C	3.0	5.0	13.0	22.0
Conductivity	umhos/cm	355	282	99	510
Dissolved oxygen	mg/l	13.7	12.9	12.1	9.4
Biological oxygen demand	mg/l	1.2	1.6	1.2	1.6
pH	mg/l	7.30	8.20	7.60	8.30
Alkalinity	mg/l	86.0	82.0	22.0	118.0
Acidity	mg/l	12.0	3.0	10.0	0.0
Solids - dissolved	mg/l	186	202	62	354
- total	mg/l	198	216	126	366
Organic carbon - total	mg/l	2.0	2.4	4.7	3.1
Free chlorine	mg/l	0	0	ND	0
Ammonia - dissolved	mg/l	0.02	0.05	0.07	0.06
- total	mg/l	0.02	0.06	0.07	0.08
Nitrite - dissolved	mg/l	0.004 K	0.006	0.004 K	0.010
- total	mg/l	0.004 K	0.008	0.004	0.010
Nitrate - dissolved	mg/l	1.12	0.52	0.26	2.23
- total	mg/l	1.12	0.52	0.26	2.23
Kjeldahl nitrogen - dissolved	mg/l	0.28	0.20 K	0.30	0.20 K
- total	mg/l	0.28	0.20 K	0.30	0.21
Orthophosphate - dissolved	mg/l	0.140	0.068	0.002	0.350
- total	mg/l	0.140	0.077	0.032	0.380
Phosphorus - dissolved	mg/l	0.17	0.10	0.04	0.42
- total	ug/l	0.17	0.10	0.09	0.43
Calcium - dissolved	mg/l	38.82	33.50	9.77	50.80
- total	mg/l	39.38	34.54	10.10	55.90
Magnesium - dissolved	mg/l	6.95	6.15	2.36	8.55
- total	ug/l	7.01	6.41	2.83	8.87
Chloride - dissolved	mg/l	28	35	6	40
- total	ug/l	28	35	6	40
Sulfate - dissolved	mg/l	29	25	14	76
- total	mg/l	29	27	14	86
Iron - dissolved	ug/l	100 K	100 K	130	100 K
- total	mg/l	100 K	190	2940	170
Manganese - dissolved	ug/l	50 K	50 K	50 K	50 K
- total	mg/l	50 K	50 K	60	50 K
Aluminum - dissolved	ug/l	150 K	150 K	150 K	170
- total	mg/l	150 K	170	2340	170
Water Quality Index	none	65	62	44	74

TABLE A-25 - MACROINVERTEBRATE DATA FOR CAYT 1.7: 1986 - 1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	3
		Stenelmis	1
	Psephenidae	Psephenus	4
Diptera	Athericidae	Atherix *	
	Chironomidae		11
	Simulidae	Simulium *	
	Tipulidae	Antocha *	
		Hexatoma *	
Ephemeroptera	Baetidae	Baetis	13
		Centroptilum *	
		Heterocloeon *	
		Pseudocloeon	8
	Caenidae	Caenis	3
	Ephemerellidae	Ephemerella	1
		Serratella *	
	Heptageniidae	Epeorus	1
		Heptagenia	23
		Stenocron *	
		Stenonema	21
	Oligoneuridae	Isonychia	2
	Polymitarcidae	Ephoron *	
	Tricorythidae	Tricorythodes	1
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus	1
	Sialidae	Sialis *	
Plecoptera	Perlidae	Acroneuria	1
		Paragnetina *	
		Phasgonophora	1
	Perlodidae	Isoperla *	
		Cultus *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Hydropsychidae	Cheumatopsyche	4
		Hydropsyche	6
		Symphitopsyche	24
	Hydroptilidae	Leucotrichia *	
		Stactobiella *	
	Philopotamidae	Chimarra	3
	Polycentropodidae	Nyctiophylax *	
Decapoda	Astacidae	Orconectes *	
Hydracarina *			
Pulmonata	Physidae	Physa *	
Tricladida	Planariidae	Dugesia	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
42	21

RBP Score: 44

Diversity Index: 3.53

APPENDIX B

DATA FOR GROUP 2 STATIONS

NOTES AND ABBREVIATIONS

Underlined values exceed water quality standards.

K = actual value is less than reported value.

ND = No data

TABLE B-1 - WATER QUALITY DATA FOR LONG ARM CREEK, SOUTH BRANCH CONEWAGO CREEK, BIG BRANCH DEER CREEK AND FALLING BRANCH DEER CREEK

Stream >		Long Arm Creek	South Branch Conewago Creek	Big Branch Deer Creek	Falling Branch Deer Creek
Station >		LNGA 2.5	SBCC 20.4	BBDC 4.1	FBDC 4.1
Date >		7/24/89	7/24/89	7/25/89	7/25/89
Time >		9:50	11:05	9:30	10:30
v Parameter v	UNITS				
Discharge	cfs	1.77	0.93	2.79	2.69
Temperature	Celsius	22.0	20.0	19.0	22.0
Conductivity	umhos/cm	180	108	122	135
Dissolved Oxygen	mg/l	8.9	8.7	9.4	9.2
Biochemical Oxygen Demand	mg/l	0.5	0.5	0.4K	0.4K
pH	S.U.	7.40	7.80	6.80	6.95
Alkalinity	mg/l	42	36	20	20
Acidity	mg/l	9	4	8	6
Solids - Dissolved	mg/l	82	58	82	92
Total	mg/l	114	64	82	92
Total Organic Carbon	mg/l	2.8	1.4	1.1	1.9
Free Chlorine	mg/l	ND	ND	ND	ND
Ammonia as N - Dissolved	mg/l	0.09	0.03	0.05	0.03
Total	mg/l	0.10	0.03	0.07	0.05
Nitrite as N - Dissolved	mg/l	0.008	0.004K	0.008	0.012
Total	mg/l	0.010	0.004K	0.008	0.012
Nitrate as N - Dissolved	mg/l	6.59	1.69	5.80	4.36
Total	mg/l	6.59	1.69	5.80	4.59
K-dahl as N - Dissolved	mg/l	0.62	0.25	0.20	0.21
Total	mg/l	0.80	0.28	0.20	0.26
Orthophosphate - Dissolved	mg/l	0.002	0.002	0.002K	0.002
Total	mg/l	0.007	0.003	0.003	0.004
Phosphorus - Dissolved	mg/l	0.04	0.03	0.03	0.03
Total	mg/l	0.08	0.04	0.03	0.03
Calcium - Dissolved	mg/l	16.6	12.10	8.82	9.26
Total	mg/l	17.3	13.00	9.85	9.43
Magnesium - Dissolved	mg/l	5.81	3.24	4.81	4.41
Total	mg/l	6.11	3.33	5.05	4.47
Chloride - Dissolved	mg/l	13	6	10	12
Total	mg/l	13	6	10	12
Sulfate - Dissolved	mg/l	10	10	10K	10K
Total	mg/l	25	21	12	13
Iron - Dissolved	ug/l	170	190	100K	100K
Total	ug/l	1340	550	100K	170
Manganese - Dissolved	ug/l	70	50K	100	90
Total	ug/l	120	50	120	100
Aluminum - Dissolved	ug/l	150K	150K	180	180
Total	ug/l	800	200	240	270
Water Quality Index	none	59	33	40	41

TABLE B-2 - WATER QUALITY DATA FOR CASCADE CREEK, TROWBRIDGE CREEK, SNAKE CREEK AND LITTLE SNAKE CREEK

Stream >		Cascade Creek	Trowbridge Creek	Snake Creek	Little Snake Creek
Station >		CASC 1.6	TROW 1.6	SNAK 2.3	LSNK 7.6
Date >		8/9/89	8/9/89	8/9/89	8/8/89
Time >		14:00	11:15	9:10	14:40
v Parameter v	UNITS				
Discharge	cfs	0.494	2.46	9.86	0.782
Temperature	Celsius	20.0	17.0	15.0	20.0
Conductivity	umhos/cm	85	80	105	125
Dissolved Oxygen	mg/l	8.8	9.8	9.9	8.5
Biochemical Oxygen Demand	mg/l	1.2	1.2	0.8	1.6
pH	S.U.	ND	ND	ND	ND
Alkalinity	mg/l	ND	ND	ND	ND
Acidity	mg/l	ND	ND	ND	ND
Solids - Dissolved	mg/l	56	56	70	94
Total	mg/l	66	56	72	134
Total Organic Carbon	mg/l	3.3	2.4	1.7	5.2
Free Chlorine	mg/l	ND	ND	ND	ND
Ammonia as N - Dissolved	mg/l	0.05	0.04	0.02	0.03
Total	mg/l	0.05	0.06	0.02	0.03
Nitrite as N - Dissolved	mg/l	0.004K	0.004K	0.004K	0.004K
Total	mg/l	0.004K	0.004K	0.004K	0.004K
Nitrate as N - Dissolved	mg/l	0.04K	0.11	0.26	0.07
Total	mg/l	0.29	0.11	0.26	0.07
K-dahl as N - Dissolved	mg/l	0.20K	0.20K	0.20K	0.20K
Total	mg/l	0.36	0.20K	0.26	0.43
Orthophosphate - Dissolved	mg/l	0.006	0.004	0.002	0.01
Total	mg/l	0.009	0.004	0.004	0.03
Phosphorus - Dissolved	mg/l	0.05	0.06	0.05	0.06
Total	mg/l	0.05	0.16	0.05	0.07
Calcium - Dissolved	mg/l	8.65	6.67	9.94	10.70
Total	mg/l	8.83	6.67	10.00	10.73
Magnesium - Dissolved	mg/l	2.45	2.13	3.05	3.14
Total	mg/l	2.45	2.20	3.08	3.26
Chloride - Dissolved	mg/l	4	5	7	10
Total	mg/l	4	5	7	10
Sulfate - Dissolved	mg/l	10K	10K	10K	31
Total	mg/l	10K	10K	10K	31
Iron - Dissolved	ug/l	800	100K	100	700
Total	ug/l	1690	110	200	1290
Manganese - Dissolved	ug/l	220	50K	50K	140
Total	ug/l	280	50K	50K	160
Aluminum - Dissolved	ug/l	150K	150K	150K	300
Total	ug/l	150K	150K	150K	470
Water Quality Index	none	35	27	28	47

TABLE B-3 - WATER QUALITY DATA FOR CHOCONUT CREEK, APALACHIN CREEK, WAPPASENING CREEK AND SACKETT CREEK

Stream >		Choconut Creek	Apalachin Creek	Wappasening Creek	Sackett Creek
Station >		CHOC 9.1	APAL 6.9	WAPP 2.6	SACK 2.6
Date >		8/8/89	8/8/89	8/8/89	8/8/89
Time >		13:30	12:10	10:15	9:00
v Parameter v	UNITS				
Discharge	cfs	3.63	2.56	9.16	0.077
Temperature	Celsius	20.0	19.0	18.0	17.0
Conductivity	umhos/cm	95	110	150	220
Dissolved Oxygen	mg/l	9.9	8.3	9.8	8.8
Biochemical Oxygen Demand	mg/l	0.8	0.4	0.8	0.4
pH	S.U.	ND	ND	ND	ND
Alkalinity	mg/l	ND	ND	ND	ND
Acidity	mg/l	ND	ND	ND	ND
Solids - Dissolved	mg/l	80	88	114	154
Total	mg/l	90	108	120	168
Total Organic Carbon	mg/l	2.2	2.2	1.7	2.1
Free Chlorine	mg/l	ND	ND	ND	ND
Ammonia as N - Dissolved	mg/l	0.02	0.07	0.02	0.02
Total	mg/l	0.02	0.07	0.02	0.02
Nitrite as N - Dissolved	mg/l	0.004K	0.004K	0.004K	0.004K
Total	mg/l	0.004K	0.004K	0.004K	0.004K
Nitrate as N - Dissolved	mg/l	0.20	0.31	0.68	0.62
Total	mg/l	0.20	0.31	0.68	0.62
K-dahl as N - Dissolved	mg/l	0.20K	0.25	0.20K	0.20K
Total	mg/l	0.38	0.30	0.20K	0.20K
Orthophosphate - Dissolved	mg/l	0.004	0.004	0.003	0.011
Total	mg/l	0.005	0.008	0.005	0.013
Phosphorus - Dissolved	mg/l	0.05	0.05	0.03	0.04
Total	mg/l	0.05	0.06	0.03	0.04
Calcium - Dissolved	mg/l	8.75	10.40	13.60	31.00
Total	mg/l	9.11	10.50	13.70	32.40
Magnesium - Dissolved	mg/l	2.69	3.24	4.23	8.08
Total	mg/l	2.75	3.24	4.27	8.40
Chloride - Dissolved	mg/l	6	5	8	8
Total	mg/l	6	5	8	8
Sulfate - Dissolved	mg/l	29	36	29	32
Total	mg/l	69	45	46	34
Iron - Dissolved	ug/l	100	190	100K	100K
Total	ug/l	180	530	100K	190
Manganese - Dissolved	ug/l	50K	100	50K	50K
Total	ug/l	50K	110	50K	50K
Aluminum - Dissolved	ug/l	150K	150K	150K	150K
Total	ug/l	150K	350	150K	150K
Water Quality Index	none	32	40	35	48

TABLE B-4 - WATER QUALITY DATA FOR PARKS CREEK, BENTLEY CREEK, SOUTH CREEK AND SEELEY CREEK

Stream >		Parks Creek	Bentley Creek	South Creek	Seeley Creek
Station >		PARK 0.7	BNTY 0.9	SOUT 2.8	SEEL 10.3
Date >		8/7/89	8/2/89	8/2/89	8/2/89
Time >		15:20	10:15	11:35	8:50
v Parameter v	UNITS				
Discharge	cfs	0.127	3.68	0.526	5.00
Temperature	Celsius	20.0	20.0	21.0	18.0
Conductivity	umhos/cm	182	240	180	305
Dissolved Oxygen	mg/l	9.0	9.7	9.3	8.9
Biochemical Oxygen Demand	mg/l	0.8	0.8	1.2	1.2
pH	S.U.	ND	ND	ND	ND
Alkalinity	mg/l	ND	ND	ND	ND
Acidity	mg/l	ND	ND	ND	ND
Solids - Dissolved	mg/l	104	158	136	190
Total	mg/l	122	158	140	190
Total Organic Carbon	mg/l	1.7	1.8	5.2	1.5
Free Chlorine	mg/l	ND	ND	ND	ND
Ammonia as N - Dissolved	mg/l	0.04	0.02	0.05	0.07
Total	mg/l	0.04	0.05	0.08	0.07
Nitrite as N - Dissolved	mg/l	0.004K	0.004K	0.004K	0.004K
Total	mg/l	0.004K	0.004K	0.004K	0.004K
Nitrate as N - Dissolved	mg/l	0.24	0.35	0.11	0.64
Total	mg/l	0.24	0.35	0.11	0.66
K-dahl as N - Dissolved	mg/l	0.20K	0.20K	0.30	0.20K
Total	mg/l	0.20K	0.20K	0.41	0.20K
Orthophosphate - Dissolved	mg/l	0.015	0.002K	0.002	0.002K
Total	mg/l	0.015	0.002	0.007	0.002
Phosphorus - Dissolved	mg/l	0.05	0.03	0.05	0.03
Total	mg/l	0.06	0.04	0.07	0.05
Calcium - Dissolved	mg/l	23.00	27.70	19.30	41.60
Total	mg/l	23.00	28.00	19.30	42.80
Magnesium - Dissolved	mg/l	6.26	6.17	4.59	7.49
Total	mg/l	6.26	6.19	4.59	7.54
Chloride - Dissolved	mg/l	3	11	11	12
Total	mg/l	3	11	11	12
Sulfate - Dissolved	mg/l	36	28	22	34
Total	mg/l	66	41	26	37
Iron - Dissolved	ug/l	190	100K	200	100K
Total	ug/l	300	120	500	110
Manganese - Dissolved	ug/l	50K	50K	50	50K
Total	ug/l	50K	50K	80	50K
Aluminum - Dissolved	ug/l	210	150K	150K	150K
Total	ug/l	250	150K	200	150K
Water Quality Index	none	45	44	49	52

TABLE B-5 - WATER QUALITY DATA FOR COWANESQUE RIVER, BILL HESS CREEK, CAMP BROOK AND HOLDEN CREEK

Stream >		Cowanesque River	Bill Hess Creek	Camp Brook	Holden Creek
Station >		COWN 2.2	HESS 0.1	CPBK 2.0	HLDN 3.5
Date >		8/1/89	8/1/89	8/1/89	8/1/89
Time >		13:30	12:55	11:55	10:55
v Parameter v	UNITS				
Discharge	cfs	52.0	0.250	0.215	0.269
Temperature	Celsius	22.0	18.0	18.0	17.0
Conductivity	umhos/cm	240	335	310	280
Dissolved Oxygen	mg/l	8.1	9.2	9.7	9.2
Biochemical Oxygen Demand	mg/l	0.4	0.4	0.4	1.0
pH	S.U.	ND	ND	7.90	7.10
Alkalinity	mg/l	ND	ND	ND	ND
Acidity	mg/l	ND	ND	ND	ND
Solids - Dissolved	mg/l	160	210	184	182
Total	mg/l	180	240	196	204
Total Organic Carbon	mg/l	5.1	1.5	2.3	2.9
Free Chlorine	mg/l	ND	ND	ND	ND
Ammonia as N - Dissolved	mg/l	0.12	0.02K	0.04	0.03
Total	mg/l	0.12	0.02	0.05	0.03
Nitrite as N - Dissolved	mg/l	0.070	0.004K	0.004K	0.004K
Total	mg/l	0.072	0.004K	0.004K	0.004K
Nitrate as N - Dissolved	mg/l	0.70	0.55	0.18	0.15
Total	mg/l	0.70	0.55	0.18	0.15
K-dahl as N - Dissolved	mg/l	0.35	0.20K	0.20K	0.20K
Total	mg/l	0.35	0.20K	0.20K	0.20K
Orthophosphate - Dissolved	mg/l	0.004	0.002	0.003	0.003
Total	mg/l	0.015	0.003	0.004	0.007
Phosphorus - Dissolved	mg/l	0.05	0.03	0.04	0.05
Total	mg/l	0.07	0.04	0.06	0.06
Calcium - Dissolved	mg/l	26.70	42.40	40.30	33.60
Total	mg/l	27.20	43.90	40.30	34.10
Magnesium - Dissolved	mg/l	5.56	10.40	10.70	10.40
Total	mg/l	5.74	10.40	10.70	10.40
Chloride - Dissolved	mg/l	13	9	7	6
Total	mg/l	14	9	7	6
Sulfate - Dissolved	mg/l	34	46	39	38
Total	mg/l	37	52	39	41
Iron - Dissolved	ug/l	180	100K	100K	100K
Total	ug/l	810	260	200	500
Manganese - Dissolved	ug/l	200	50K	50K	50K
Total	ug/l	270	50K	50K	50K
Aluminum - Dissolved	ug/l	140	150K	150K	150K
Total	ug/l	850	550	150	520
Water Quality Index	none	64	51	50	51

TABLE B-6 - WATER QUALITY DATA FOR TROUPS CREEK, NORTH FORK COWANESQUE RIVER AND WHITE BRANCH

Stream >		Troups Creek	North Fork Cowanesque River	White Branch
Station >		TRUP 4.5	NFCR 7.6	WTBR 1.5
Date >		8/1/89	7/31/89	7/31/89
Time >		9:30	14:10	12:50
v Parameter v	UNITS			
Discharge	cfs	22.5	1.05	0.712
Temperature	Celsius	18.0	16.0	16.0
Conductivity	umhos/cm	230	150	200
Dissolved Oxygen	mg/l	10.6	9.5	8.7
Biochemical Oxygen Demand	mg/l	0.4K	0.4	0.4
pH	S.U.	7.60	7.8	8.00
Alkalinity	mg/l	ND	41	36
Acidity	mg/l	ND	6	6
Solids - Dissolved	mg/l	152	100	148
Total	mg/l	228	1376	152
Total Organic Carbon	mg/l	3.6	4.2	4.0
Free Chlorine	mg/l	0	ND	ND
Ammonia as N - Dissolved	mg/l	0.05	0.06	0.05
Total	mg/l	0.07	0.12	0.07
Nitrite as N - Dissolved	mg/l	0.004K	0.004K	0.010
Total	mg/l	0.004	0.004K	0.010
Nitrate as N - Dissolved	mg/l	0.44	1.54	5.8
Total	mg/l	0.44	1.56	5.8
K-dahl as N - Dissolved	mg/l	0.20K	0.20K	0.26
Total	mg/l	0.32	0.20K	0.26
Orthophosphate - Dissolved	mg/l	0.004	0.019	0.003
Total	mg/l	0.020	0.040	0.006
Phosphorus - Dissolved	mg/l	0.04	0.08	0.04
Total	mg/l	0.05	0.10	0.06
Calcium - Dissolved	mg/l	26.00	15.90	20.10
Total	mg/l	27.30	15.90	20.10
Magnesium - Dissolved	mg/l	6.26	5.01	6.28
Total	mg/l	6.28	5.09	6.28
Chloride - Dissolved	mg/l	12	9	14
Total	mg/l	12	10	14
Sulfate - Dissolved	mg/l	36	29	42
Total	mg/l	37	41	42
Iron - Dissolved	ug/l	100K	100K	100K
Total	ug/l	1400	120	320
Manganese - Dissolved	ug/l	50K	50K	50K
Total	ug/l	50K	50K	50
Aluminum - Dissolved	ug/l	150K	150K	150K
Total	ug/l	1700	210	220
Water Quality Index	none	55	52	51

TABLE B-7 - MACROINVERTEBRATE DATA FOR LONG ARM CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Macronychus *	
		Optioservus	2
		Stenelmis	1
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix	1
	Chironomidae		16
	Simulidae	Simulium	2
	Tipulidae	Antocha	11
		Tipula *	
Ephemeroptera	Baetidae	Baetis	33
		Heterocloeon	2
	Caenidae	Caenis *	
	Ephemerellidae	Serratella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Heptagenia *	
		Stenocron *	
		Stenonema	2
	Leptophlebiidae	Paraleptophlebia	2
	Oligoneuridae	Isonychia	1
Megaloptera	Corydalidae	Nigronia	1
	Sialidae	Sialis *	
Plecoptera	Perlidae	Phasgonophora *	
Trichoptera	Glossomatidae	Glossosoma	5
	Hydropsychidae	Cheumatopsyche	9
		Hydropsyche	18
		Symphitopsyche	8
Decapoda	Astacidae	Cambarus	1
		Orconectes *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
28	18

RBP Score: 32

Diversity index: 3.28

TABLE B-8 - MACROINVERTEBRATE DATA FOR SOUTH BRANCH CONEWAGO CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	12
		Stenelmis *	
Diptera	Chironomidae		23
	Dixidae	Dixa *	
	Tabanidae	Chrysops	2
	Tipulidae	Antocha *	
		Hexatoma	1
		Pedicia	1
		Tipula	1
Ephemeroptera	Baetidae	Baetis	4
		Centroptilum	1
	Ephemerellidae	Ephemerella	1
	Heptageniidae	Heptagenia	2
		Stenonema	22
	Leptophlebiidae	Paraleptophlebia	3
Megaloptera	Corydalidae	Nigronia	2
Odonata	Coenogrionidae	Argia	1
	Gomphidae	Gomphus	1
		Stylogomphus	1
Plecoptera	Leuctridae	Leuctra	27
	Perlidae	Acroneuria	1
		Phasgonophora	1
Trichoptera	Glossomatidae	Glossosoma	2
	Hydropsychidae	Cheumatopsyche	2
		Hydropsyche	3
		Symphitopsyche	2
	Philopotamidae	Chimarra *	
		Dolophilodes	2

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
28	24

RBP Score: 44

Diversity index: 3.39

TABLE B-9 - MACROINVERTEBRATE DATA FOR BIG BRANCH DEER CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	7
	Psephenidae	Ectopria *	
		Psephenus	1
	Ptilodactylidae	Anchytarsus *	
Diptera	Chironomidae		7
	Empididae	Hemerodromia *	
	Simulidae	Simulium	13
	Tipulidae	Antocha *	
		Tipula	1
Ephemeroptera	Baetidae	Cloeon *	
		Heterocloeon *	
		Pseudocloeon *	
	Ephemerellidae	Serratella *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Stenonema	7
	Oligoneuridae	Isonychia	1
Megaloptera	Corydalidae	Chauliodes	12
		Nigronia *	
	Sialidae	Sialis	1
Odonata	Calopterygidae	Hetaerina *	
	Gomphidae	Gomphus	1
		Hagenius	1
Plecoptera	Leuctridae	Leuctra	3
	Perlodidae	Isoperla *	
Trichoptera	Glossomatidae	Glossosoma	4
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche	12
		Symphitopsyche	46
	Philopotamidae	Chimarra *	
		Dolophilodes	4
Decapoda	Astacidae	Cambarus	1
Tricladida	Planariidae	Dugesia	3

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
33	18

RBP Score: 26

Diversity index: 3.20

TABLE B-10 - MACROINVERTEBRATE DATA FOR FALLING BRANCH DEER CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	2
		Stenelmis	1
	Chironomidae		33
	Empididae	Hemerodromia	1
	Simulidae	Simulium	1
	Tipulidae	Antocha	5
Ephemeroptera	Baetidae	Baetis	1
		Centroptilum *	
		Heterocloeon *	
		Pseudocloeon *	
	Ephemerellidae	Serratella *	
	Heptageniidae	Epeorus *	
		Stenonema	2
	Leptophlebiidae	Paraleptophlebia	1
	Oligoneuridae	Isonychia *	
Megaloptera	Corydalidae	Chauliodes	1
		Nigronia *	
Plecoptera	Leuctridae	Leuctra	1
Trichoptera	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	11
		Hydropsyche	4
		Symphitopsyche	27
	Philopotamidae	Chimarra *	
Oligochaeta	Naididae		1

* - Taxa not collected during 1989

NUMBER OF TAXA

1988 - 1989	1989
24	15

RBP Score: 20

Diversity index: 2.65

TABLE B-11 - MACROINVERTEBRATE DATA FOR CASCADE CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Stenelmis	1
	Psephenidae	Psephenus *	
Diptera	Chironomidae		32
	Simulidae	Simulium	2
	Tipulidae	Hexatoma	1
Ephemeroptera	Baetidae	Pseudocloeon *	
	Caenidae	Caenis *	
	Ephemeridae	Ephemera	1
	Heptageniidae	Epeorus	1
		Heptagenia	1
		Stenocron *	
		Stenonema	29
	Leptophlebiidae *		
	Oligoneuridae	Isonychia	9
	Tricorythidae	Leptohypes *	
Megaloptera	Corydalidae	Nigronia	1
	Sialidae	Sialis	2
Odonata	Aeshnidae	Boyeria	1
	Calopterygidae	Hetaerina *	
	Gomphidae	Gomphus	1
		Hagenius *	
Plecoptera	Perlidae	Acroneuria	1
		Phasgonophora	2
	Pteronarcidae	Pteronarcys	1
Trichoptera	Hydropsychidae	Hydropsyche	12
		Symphitopsyche	1
	Limnephilidae	Hydatophylax	1
	Philopotamidae	Chimarra	33
Decapoda	Astacidae	Procambarus	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
29	21

RBP Score: 34

Diversity index: 2.80

TABLE B-12 - MACROINVERTEBRATE DATA FOR TROWBRIDGE CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Stenelmis	3
	Psephenidae	Psephenus	4
Diptera	Athericidae	Atherix	1
	Chironomidae		65
	Empididae	Hemerodromia	1
	Simulidae	Simulium *	
	Tipulidae	Antocha	3
		Hexatoma	6
		Pedicia	1
		Tipula	1
Ephemeroptera	Baetidae	Baetis	7
		Neocloeon	1
	Heptageniidae	Heptagenia *	
		Stenocron	4
		Stenonema	11
	Oligoneuridae	Isonychia	3
	Potamanthidae	Potamanthus	1
Megaloptera	Corydalidae	Nigronia	3
Odonata	Aeshnidae	Boyeria	2
	Gomphidae	Ophiogomphus	2
Plecoptera	Capniidae	Paracapnia	1
	Perlidae	Paragnetina	1
		Phasgonophora	2
Trichoptera	Hydropsychidae	Cheumatopsyche	6
		Symphitopsyche	9
	Philopotamidae	Dolophilodes	3

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
26	24

RBP Score: 26

Diversity index: 3.23

TABLE B-13 - MACROINVERTEBRATE DATA FOR SNAKE CREEK: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Macronychus *	
		Optioservus	2
		Stenelmis	1
	Psephenidae	Psephenus	6
Diptera	Athericidae	Atherix	2
	Chironomidae		11
	Tipulidae	Antocha *	
		Tipula	1
Ephemeroptera	Baetidae	Baetis	11
		Centroptilum *	
		Heterocloeon *	
		Neocloeon *	
		Pseudocloeon	5
	Caenidae	Caenis	4
	Ephemerellidae	Ephemerella *	
		Serratella *	
	Heptageniidae	Epeorus	7
		Heptagenia	6
		Stenocron *	
		Stenonema	11
	Leptophlebiidae	Paraleptophlebia	2
	Oligoneuridae	Isonychia	11
Megaloptera	Corydalidae	Corydalus *	
		Chauliodes *	
		Nigronia	1
	Sialidae	Sialis *	
Odonata	Gomphidae	Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra *	
	Nemouridae	Amphinemura	1
	Perlidae	Acroneuria	1
		Neoperla	1
		Paragnetina	1
		Phasgonophora	1
Trichoptera	Hydropsychidae	Cheumatopsyche	12
		Hydropsyche	15
		Parapsyche *	
		Symphitopsyche	24
	Hydroptilidae	Leucotrichia *	
	Philopotamidae	Chimarra	4
	Polycentropoidae	Neureclipsis *	
Decapoda	Astacidae	Cambarus	1
Heterodonta	Sphaeridae	Psidium *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
42	25

RBP Score: 48

Diversity index: 4.04

TABLE B-14 - MACROINVERTEBRATE DATA FOR LITTLE SNAKE CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	2
		Stenelmis	10
	Psephenidae	Psephenus	5
Diptera	Athericidae	Atherix	1
	Chironomidae		26
	Empididae	Hemerodromia	1
	Simulidae	Simulium	1
	Tipulidae	Antocha	1
		Hexatoma	3
		Tipula	1
Ephemeroptera	Baetidae	Neocloeon	5
		Pseudocloeon	1
	Caenidae	Caenis	1
	Ephemerellidae	Ephemerella	1
		Eurylophella	1
	Ephemeridae	Ephemera	1
	Heptageniidae	Heptagenia	1
		Stenonema	5
	Leptophlebiidae	Paraleptophlebia	1
	Oligoneuridae	Isonychia	10
Megaloptera	Corydalidae	Nigronia	1
Odonata	Gomphidae	Hagenius	1
		Stylogomphus	2
Plecoptera	Perlidae	Acroneuria	1
		Paragnetina *	
		Phasgonophora	1
Trichoptera	Hydropsychidae	Cheumatopsyche	15
		Hydropsyche	9
		Symphitopsyche	5
	Philopotamidae	Chimarra	4
Decapoda	Astacidae	Cambarus	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
31	30

RBP Score: 40

Diversity index: 4.03

TABLE B-15 - MACROINVERTEBRATE DATA FOR CHOCONUT CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	1
		Stenelmis	1
	Psephenidae	Psephenus	2
Diptera	Chironomidae		12
	Empididae	Hemerodromia *	
	Tipulidae	Antocha	3
		Hexatoma	1
		Tipula	1
Ephemeroptera	Baetidae	Baetis	4
		Pseudocloeon	1
	Caenidae	Caenis	9
	Ephemerellidae	Ephemerella *	
		Serratella *	
	Heptageniidae	Epeorus *	
		Heptagenia	7
		Stenonema	13
	Oligoneuridae	Isonychia	29
Megaloptera	Corydalidae	Nigronia	1
Odonata	Gomphidae	Gomphus	1
Plecoptera	Perlidae	Acroneuria	1
		Phasgonophora	1
	Perlodidae	Isoperla *	
Trichoptera	Hydropsychidae	Cheumatopsyche	4
		Hydropsyche	3
		Symphitopsyche	20
	Philopotamidae	Chimarra	16
	Polycentropoidae	Neureclipsis	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
27	22

RBP Score: 40

Diversity index: 3.54

TABLE B-16 - MACROINVERTEBRATE DATA FOR APALACHIN CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Ordobrevia *	
		Optioservus	7
		Stenelmis	13
	Psephenidae	Psephenus	1
Diptera	Chironomidae		6
	Simulidae	Simulium	2
	Tipulidae	Hexatoma	3
		Tipula	1
Ephemeroptera	Baetidae	Baetis	5
		Centroptilum *	
	Caenidae	Caenis	4
	Ephemerellidae	Serratella *	
	Heptageniidae	Heptagenia	2
		Stenocron *	
		Stenonema	14
	Leptophlebiidae *		
	Oligoneuridae	Isonychia	5
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis	1
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus	1
Plecoptera	Perlidae	Acroneuria	1
	Perlodidae	Isoperla *	
Trichoptera	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche	11
		Symphitopsyche	1
	Philopotamidae	Chimarra	27
Decapoda	Astacidae	Cambarus	1
		Orconectes *	
Heterodonta	Sphaeridae *		

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
31	20

RBP Score: 36

Diversity index: 3.58

TABLE B-17 - MACROINVERTEBRATE DATA FOR WAPPASENING CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	5
		Stenelmis	1
	Gyrinidae	Dineutis	1
	Psephenidae	Psephenus	4
Diptera	Athericidae	Atherix	2
	Chironomidae		9
	Empididae	Hemerodromia *	
	Tipulidae	Antocha	1
		Hexatoma	1
		Limonia	1
		Tipula *	
Ephemeroptera	Baetidae	Baetis	10
	Caenidae	Caenis	1
	Ephemerellidae	Ephemerella	3
	Heptageniidae	Epeorus	1
		Heptagenia	6
		Stenocron *	
		Stenonema	24
	Leptophlebiidae	Leptophlebia *	
	Oligoneuridae	Isonychia	10
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Corydalus	1
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Coenogrionidae	Argia *	
	Gomphidae	Hagenius	1
		Ophiogomphus *	
Plecoptera	Perlidae	Paragnetina	1
Trichoptera	Glossomatidae	Glossosoma	1
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	12
		Symphitopsyche	16
	Hydroptilidae	Stactobiella *	
	Philopotamidae	Chimarra	3
Pulmonata	Physidae	Physa *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
35	24

RBP Score: 42

Diversity index: 3.85

TABLE B-18 - MACROINVERTEBRATE DATA FOR SACKETT CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus *	
		Stenelmis	1
	Psephenidae	Psephenus	29
Diptera	Chironomidae		14
	Tipulidae	Hexatoma	1
		Tipula *	
Ephemeroptera	Baetidae	Baetis	2
	Caenidae	Caenis	2
	Heptageniidae	Epeorus	1
		Heptagenia	1
		Stenocron	7
		Stenonema	42
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia	4
	Oligoneuridae	Isonychia	1
Megaloptera	Corydalidae	Chauliodes *	
		Nigronia	1
Odonata	Gomphidae	Ophiogomphus *	
Plecoptera	Perlidae	Acroneuria	1
Trichoptera	Glossomatidae	Glossosoma	1
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche *	
		Symphitopsyche *	
	Philopotamidae	Chimarra *	
Collembola			1
Decapoda	Astacidae *		

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
25	16

RBP Score: 26

Diversity index: 2.89

TABLE B-19 - MACROINVERTEBRATE DATA FOR PARKS CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	1
		Stenelmis	3
	Psephenidae	Psephenus	5
Diptera	Chironomidae		36
	Tipulidae	Antocha	1
		Hexatoma *	
Ephemeroptera	Baetidae	Baetis *	
		Centroptilum	7
		Pseudocloeon	12
	Heptageniidae	Heptagenia	1
		Stenocron	8
		Stenonema	15
	Leptophlebiidae	Paraleptophlebia	2
	Potamanthidae	Potamanthus	1
	Tricorythidae	Tricorythodes	1
Megaloptera	Corydalidae	Nigronia	1
Odonata	Gomphidae	Gomphus	1
		Hagenius	1
Plecoptera	Leuctridae	Leuctra	1
	Perlidae	Acroneuria	2
		Neoperla *	
Trichoptera	Glossomatidae	Glossosoma	3
	Hydropsychidae	Cheumatopsyche	2
		Hydropsyche	7
		Macronemum	1
		Symphitopsyche	8
	Limnephilidae	Hydatophylax	1
		Pycnopsyche *	
	Philopotamidae	Chimarra	4
		Dolophilodes *	
Hydracarina			1
Decapoda	Astacidae	Cambarus	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
32	27

RBP Score: 42

Diversity index: 3.82

TABLE B-20 - MACROINVERTEBRATE DATA FOR BENTLEY CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus *	
		Stenelmis	2
	Hydrophilidae	Tropisternus *	
	Psephenidae	Psephenus	6
Diptera	Chironomidae		37
	Empididae	Hemerodromia *	
	Simulidae	Simulium	1
	Tipulidae	Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	16
		Pseudocloeon	5
	Caenidae	Caenis	3
	Heptageniidae	Epeorus	8
		Heptagenia	7
		Stenocron	1
		Stenonema	8
	Leptophlebiidae	Leptophlebia	1
		Paraleptophlebia	1
	Oligoneuridae	Isonychia	13
	Tricorythidae	Tricorythodes	3
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis *	
Odonata	Gomphidae	Gomphus *	
		Stylogomphus	1
Plecoptera	Perlidae	Acroneuria *	
		Paragnetina *	
		Phasgonophora	1
Trichoptera	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	1
		Hydropsyche	4
		Symphitopsyche	11
	Hydroptilidae	Stactobiella *	
	Leptoceridae	Mystacides *	
	Philopotamidae	Chimarra *	
	Polycentropoidae	Neureclipsis *	
Decapoda	Astacidae	Cambarus *	
Pulmonata	Physidae	Physa *	

* - Taxa not collected in 1989

NUMBER OF TAXA	
1988 - 1989	1989
37	20

RBP Score: 32

Diversity index: 3.50

TABLE B-21 - MACROINVERTEBRATE DATA FOR SOUTH CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Dubiraphia	1
		Optioservus	1
		Stenelmis	5
	Psephenidae	Psephenus	4
Diptera	Athericidae	Atherix	1
	Chironomidae		7
	Empididae	Hemerodromia	1
	Simulidae	Simulium	1
	Tabanidae	Chrysops	1
	Tipulidae	Antocha	1
Ephemeroptera	Baetidae	Baetis	2
		Pseudocloeon	3
	Caenidae	Caenis	1
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus	2
		Heptagenia	1
		Stenonema	4
	Leptophlebiidae	Leptophlebia	1
		Paraleptophlebia	1
	Oligoneuridae	Isonychia	2
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Corydalus *	
		Chauliodes	1
	Sialidae	Sialis	1
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus	1
Plecoptera	Perlidae	Acroneuria	1
		Neoperla	1
Trichoptera	Brachycentridae	Brachycentrus *	
	Hydropsychidae	Cheumatopsyche	11
		Hydropsyche	29
		Symphitopsyche	4
	Hydroptilidae	Stactobiella	1
	Philopotamidae	Chimarra	27
	Polycentropoidae	Neureclipsis	1
		Nyctiophylax	1
Hydracarina			1
Collembola			1
Decapoda	Astacidae *		
Heterodonta	Sphaeridae *		
Tricladida	Planariidae	Dugesia	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
41	34

RBP Score: 46

Diversity index: 4.02

TABLE B-22 MACROINVERTEBRATE DATA FOR SEELEY CREEK: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus *	
		Stenelmis *	
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix	1
	Chironomidae		73
	Empididae	Hemerodromia *	
	Tipulidae	Antocha	1
		Hexatoma	1
		Limonia *	
		Tipula	1
Ephemeroptera	Baetidae	Baetis	5
		Centroptilum	8
		Cloeon *	
	Caenidae	Caenis	2
	Ephemerellidae	Drunella *	
		Eurylophella *	
		Serratella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus	7
		Heptagenia *	
		Stenocron *	
		Stenonema	6
	Leptophlebiidae	Leptophlebia	1
		Paraleptophlebia	2
	Oligoneuridae	Isonychia	2
	Tricorythidae	Leptohypes *	
		Tricorythodes	1
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis *	
Odonata	Gomphidae	Erpetogomphus *	
		Ophiogomphus	1
		Stylogomphus *	
Plecoptera	Nemouridae	Amphinemura	1
	Perlidae	Acroneuria	1
		Phasgonophora	1
	Perlodidae	Isoperla *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Glossomatidae	Glossosoma	1
	Hydropsychidae	Cheumatopsyche	2
		Hydropsyche	7
		Symphitopsyche	15
	Hydroptilidae	Leucotrichia *	
		Stactobiella *	
	Philopotamidae	Chimarra	2
	Polycentropoidae	Neureclipsis *	
Pulmonata	Physidae	Physa *	
Oligochaeta	Lumbriculidae	Rhynchelmis *	
	Planorbidae	Gyraulus *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
48	24

RBP Score: 32

Diversity index: 2.90

TABLE B-23 - MACROINVERTEBRATE DATA FOR COWANESQUE RIVER: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Stenelmis	1
	Hydrophilidae	Berosus	1
Diptera	Athericidae	Atherix *	
	Chironomidae		86
	Empididae	Hemerodromia *	
	Simulidae	Simulium	20
	Tipulidae	Antocha *	
Ephemeroptera	Baetidae	Pseudocloeon *	
	Caenidae	Caenis *	
	Heptageniidae	Heptagenia	1
		Stenonema	1
Megaloptera	Corydalidae	Corydalus *	
Odonata	Coenogrionidae	Argia	1
Trichoptera	Brachycentridae	Brachycentrus *	
	Hydropsychidae	Cheumatopsyche	11
		Hydropsyche	2
		Symphitopsyche	1
	Hydroptilidae	Stactobiella *	
	Polycentropoidae	Nyctiophylax *	
		Polycentropus *	
Isopoda	Asellidae	Asellus	9
Decapoda	Astacidae	Orconectes *	
Heterodonta	Sphaeridae *		

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
23	11

RBP Score: 10

Diversity index: 1.72

TABLE B-24 - MACROINVERTEBRATE DATA FOR BILL HESS CREEK: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	2
		Stenelmis	4
	Gyrinidae	Gyrinus	1
	Psephenidae	Psephenus	9
Diptera	Athericidae	Atherix *	
	Chironomidae		37
	Empididae	Hemerodromia	2
	Simulidae	Simulium *	
	Tipulidae	Antocha	4
		Hexatoma	1
Ephemeroptera	Baetidae	Baetis *	
		Centroptilum	9
		Pseudocloeon *	
	Caenidae	Caenis	1
	Ephemerellidae	Serratella *	
	Heptageniidae	Heptagenia *	
		Rhithrogena *	
		Stenocron	2
		Stenonema	7
	Leptophlebiidae	Leptophlebia	1
		Paraleptophlebia	2
	Oligoneuridae	Isonychia *	
	Polymitarcidae	Ephoron *	
	Potamanthidae	Potamanthus *	
	Tricorythidae	Tricorythodes	33
Lepidoptera	Pyralidae	Petrophila *	
Odonata	Coenogrionidae	Argia *	
	Gomphidae	Gomphus	1
		Ophiogomphus	1
Plecoptera	Leuctridae	Leuctra *	
	Nemouridae	Amphinemura	1
	Perlidae	Acroneuria *	
		Neoperla	2
		Phasgonaphora	2
Trichoptera	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche *	
		Macronemum *	
		Symphitopsyche	1
	Hydroptilidae	Agraylea	1
		Ochrotrichia *	
		Stactobiella *	
Amphipoda	Gammaridae	Gammarus *	
Decapoda	Astacidae	Cambarus *	
Heterodonta	Sphaeridae	Musculium *	
Tricladida	Planariidae	Dugesia *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1986 - 1989	1989
44	22

RBP Score: 32

Diversity index: 3.28

TABLE B-25 - MACROINVERTEBRATE DATA FOR CAMP BROOK: 1986-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	1
		Stenelmis *	
	Psephenida	Psephenus	22
Diptera	Chironomidae		11
	Empididae	Hemerodromia *	
	Tipulidae	Antocha	2
		Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	13
		Centroptilum *	
		Heterocloeon *	
		Pseudocloeon	5
	Ephemerellidae	Serratella	2
	Heptageniidae	Stenonema	1
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuridae	Isonychia	9
	Tricorythidae	Leptohypes	1
Plecoptera	Leuctridae	Leuctra	1
	Perlidae	Acroneuria *	
		Phasgonophora	7
Trichoptera	Glossomatidae	Protoptila	1
	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche	25
		Symphitopsyche	3
	Hydroptilidae	Stactobiella *	
	Philopotamidae	Chimarra	4
		Dolophilodes	1

* - Taxa not collected in 1989

NUMBER OF TAXA	
1986 - 1989	1989
27	18

RBP Score: 34

Diversity index: 3.38

TABLE B-26 - MACROINVERTEBRATE DATA FOR HOLDEN CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	1
		Stenelmis	3
	Gyrinidae	Dineutis	1
	Psephenidae	Ectopria *	
		Psephenus	9
	Chironomidae		19
	Empididae	Hemerodromia *	
	Tipulidae	Antocha	1
		Hexatoma	1
		Tipula	1
Ephemeroptera	Baetidae	Baetis	14
		Centroptilum *	
	Caenidae	Caenis	25
	Ephemeridae	Ephemera	1
	Heptageniidae	Epeorus	1
		Heptagenia	3
		Stenocron	1
		Stenonema	13
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia	17
	Oligoneuridae	Isonychia	1
	Tricorythidae	Tricorythodes	1
Megaloptera	Corydalidae	Nigronia	1
Odonata	Coenogrionidae	Argia *	
	Gomphidae	Gomphus	1
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	2
	Perlidae	Acroneuria	1
		Phasgonophora	2
Trichoptera	Hydropsychidae	Cheumatopsyche	2
		Hydropsyche	2
		Symphitopsyche	2
	Philopotamidae	Chimarra	1
	Polycentropoidae	Neureclipsis	3
Decapoda	Astacidae	Cambarus *	
Heterodonta	Sphaeridae *		

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
36	28

RBP Score: 44

Diversity index: 3.76

TABLE B-27 - MACROINVERTEBRATE DATA FOR TROUPS CREEK: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus *	
		Stenelmis	1
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix *	
	Chironomidae		11
	Empididae	Hemerodromia *	
	Tipulidae	Hexatoma *	
		Tipula	1
Ephemeroptera	Baetidae	Baetis	3
		Pseudocloeon	2
	Caenidae	Caenis *	
	Heptageniidae	Heptagenia	1
		Stenonema	4
	Oligoneuridae	Isonychia	1
	Tricorythidae	Leptohypes	2
		Tricorythodes *	
Megaloptera	Corydalidae	Nigronia *	
Odonata	Coenogrionidae	Argia *	
	Gomphidae	Gomphus *	
		Hagenius	1
		Ophiogomphus	1
		Stylogomphus*	
Plecoptera	Leuctridae	Leuctra *	
	Perlidae	Neoperla	6
		Phasgonophora *	
Trichoptera	Hydropsychidae	Cheumatopsyche	1
		Hydropsyche	2
		Symphitopsyche	35
	Hydroptilidae	Stactobiella *	
Pulmonata	Physidae	Physa *	

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
30	16

RBP Score: 22

Diversity index: 2.78

TABLE B-28 - MACROINVERTEBRATE DATA FOR NORTH FORK COWANESQUE RIVER: 1988-1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	2
		Stenelmis *	
	Hydrophilidae	Laccobius *	
	Psephenidae	Psephenus	8
Diptera	Athericidae	Atherix *	
	Chironomidae		33
	Empididae	Hemerodromia	1
	Tabanidae	Chrysops	1
	Tipulidae	Hexatoma	1
		Tipula	1
Ephemeroptera	Baetidae	Baetis	16
		Pseudocloeon	4
	Caenidae	Caenis	3
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus	1
		Heptagenia	11
		Ironodes	1
		Stenocron	1
		Stenonema	5
	Leptophlebiidae	Paraleptophlebia	4
	Oligoneuridae	Isonychia	5
	Tricorythidae	Tricorythodes	1
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	14
	Perlidae	Paragnetina	1
		Phasgonophora	1
Trichoptera	Glossomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	1
		Hydropsyche	2
		Symphitopsyche	2
	Philopotamidae	Chimarra *	
Decapoda	Astacidae	Cambarus	1

* - Taxa not collected in 1989

NUMBER OF TAXA

1988 - 1989	1989
33	25

RBP Score: 38

Diversity index: 3.69

TABLE B-29 - MACROINVERTEBRATE DATA FOR WHITE BRANCH: 1989

ORDER	FAMILY	GENUS	INDIVIDUALS COLLECTED
Coleoptera	Elmidae	Optioservus	1
	Psephenidae	Psephenus	2
Diptera	Chironomidae		25
	Tipulidae	Antocha	2
		Hexatoma	1
Ephemeroptera	Baetidae	Baetis	23
		Pseudocloeon	9
	Caenidae	Caenis	1
	Heptageniidae	Epeorus	1
		Heptagenia	1
		Stenocron	1
		Stenonema	10
	Leptophlebiidae	Paraleptophlebia	4
	Oligoneuridae	Isonychia	2
Plecoptera	Leuctridae	Leuctra	2
	Perlidae	Acroneuria	3
		Phasgonophora	2
Trichoptera	Glossomatidae	Glossosoma	1
	Hydropsychidae	Cheumatopsyche	2
		Hydropsyche	14
		Symphitopsyche	12
	Philopotamidae	Chimarra	2
		Dolophilodes	1

NUMBER OF TAXA

1989
23

RBP Score: 40

Diversity index: 3.74

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